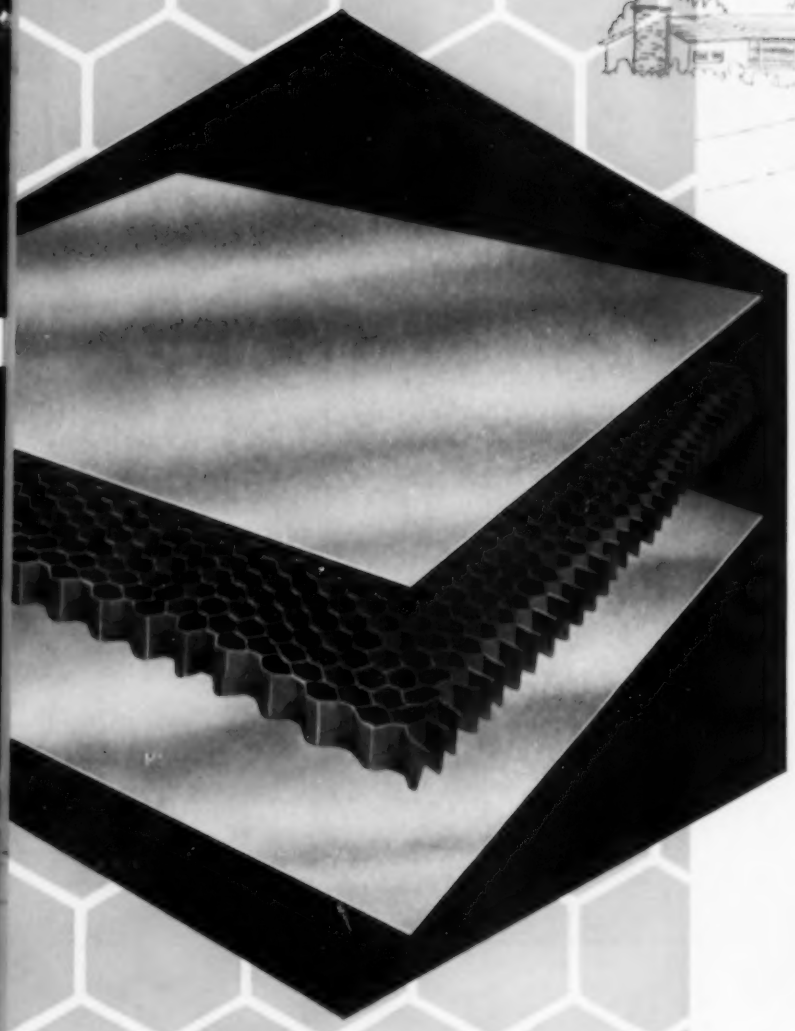
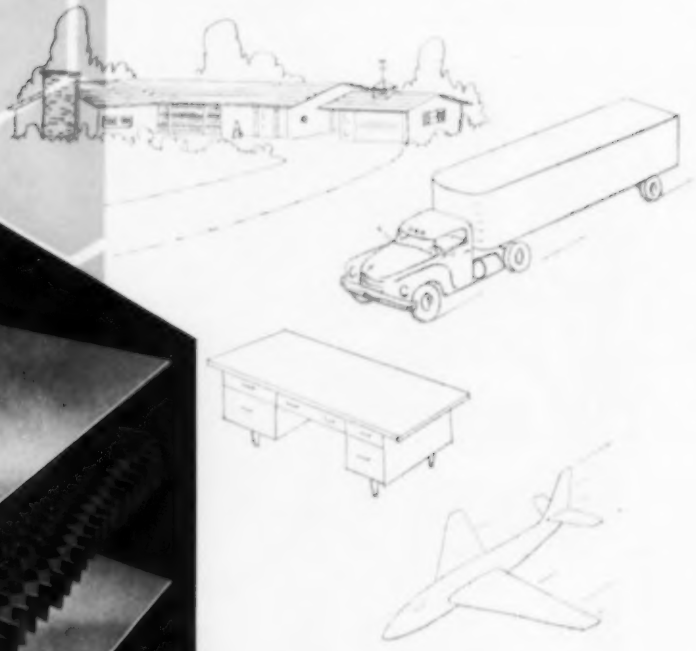
JUNE 11, 1956

STEEL

The Metalworking Weekly

A PENTON PUBLICATION





Honeycomb

. . . sandwich that keeps weight down . . . page 112

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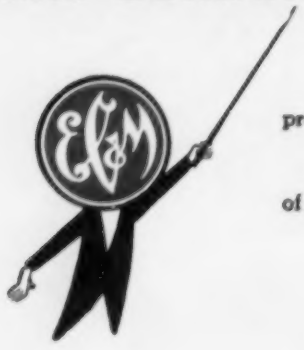
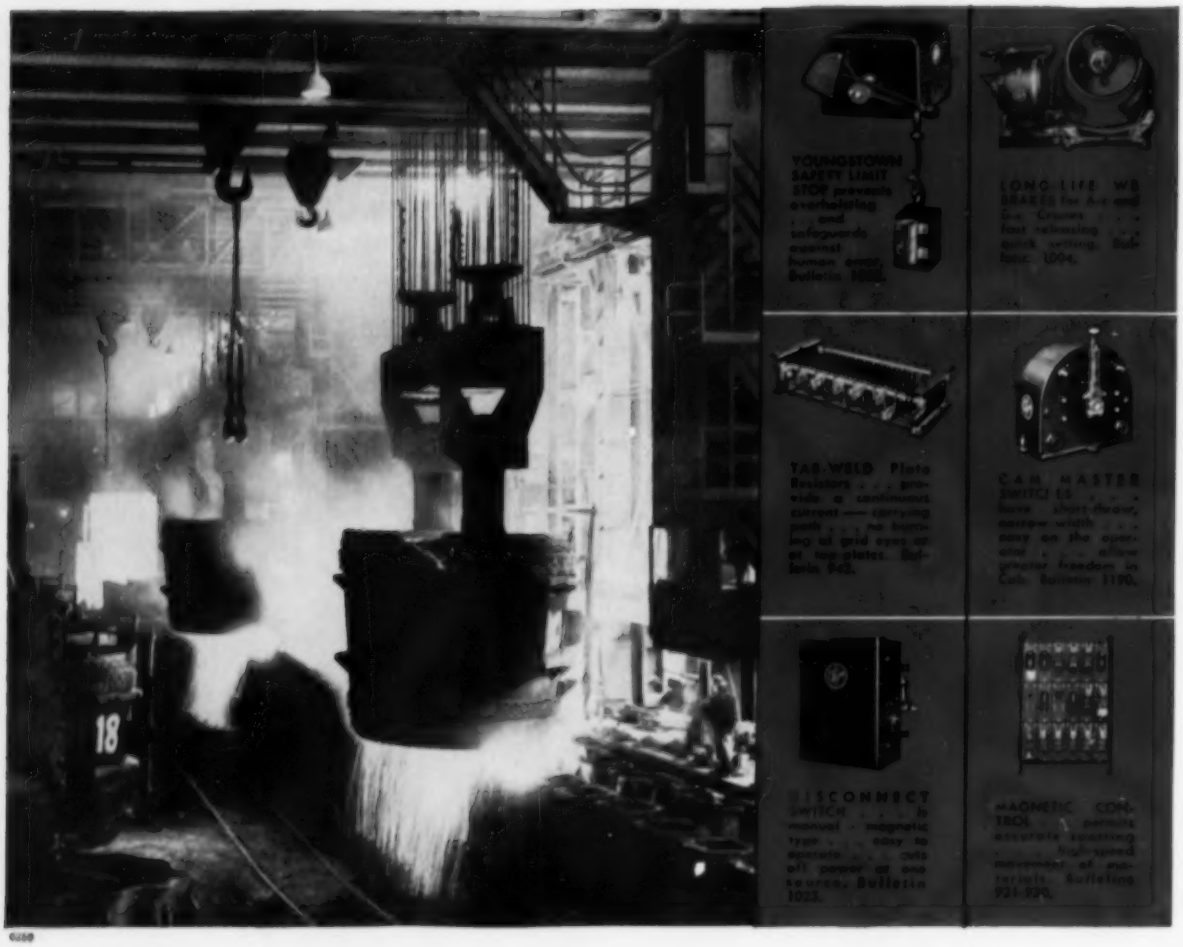
Crane Control...engineered to order by EC&M



King size or regular . . . from giant ladle cranes to standard production cranes, EC&M designs the Control equipment specifically for each crane. All control components are engineered and coordinated from the crane data sheet. EC&M uses this method of manufacture to assure precise performance. Operation is smooth . . . response is fast . . . ability to secure accurate inching and quick maneuverability is unsurpassed.

When revamping existing installations or buying new cranes, specify EC&M for complete control . . . control that is engineered to order.



SQUARE D COMPANY

EC & M DIVISION • CLEVELAND 28, OHIO

He cuts quite a figure in the sheet steel picture too

You probably have at least one portable electric tool in your own home workshop; millions of Americans do. The growth of "do-it-yourself" is a modern phenomenon so well-known it scarcely needs elaboration here.

The great majority of these power tools are packaged in individual kit boxes—made of sheet steel. When you add up all the portable electric drills, sanders, circular saws and accessory kits that have moved across the counter in the last ten years, you arrive at a sheet steel requirement that runs into a considerable tonnage.

Bethlehem sheets are doing their share in this development, just as they are in numerous other applications which have vaulted ahead since World War II. Such items as television cabinets, air-conditioners, agricultural machinery, ironing boards and many others are making rapid growth, setting up steadily increasing demands for sheet steel.

At the same time, the longer-established users of sheets are making progress too. Bethlehem's job, of course, is to help satisfy these mounting demands for sheets. The job is a difficult one, but you may be sure we are sincerely trying to perform it in a manner that's fair to every one of our customers.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM SHEETS

BETHLEHEM STEEL

SKF® Has Them All

If you want to be *sure* you are putting the right bearing in the right place in your product, check with SKF—the *one* bearing manufacturer selling all four major types of anti-friction bearings. From this single source, you quickly and easily get unbiased advice based on the broadest experience in the anti-friction field. **SKF INDUSTRIES, INC.**, PHILADELPHIA 32, PA.

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Spherical Roller Bearings Tyson Tapered Roller Bearings

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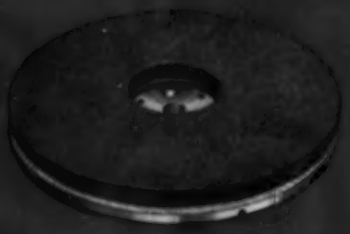
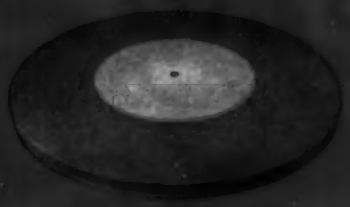


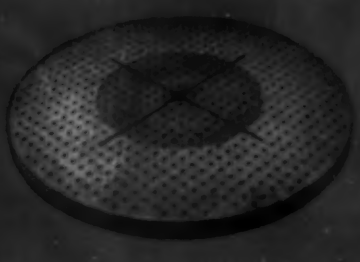
Smooth face for most general purpose grinding jobs



Combination grade maintains a uniform flat surface for the job requirement

Deep corrugated face provides fast, cool cutting

Combined smooth and corrugated face for shear cuts, cool cutting and good chip clearance



Combination grade and face with radial lines for even wear, cool cutting and uniform coolant distribution

How Gardner cuts grinding costs with the right abrasive for the job

—by recommending right type, grade and grain

—by selecting the best cutting surface

and

—by accuracy in filling repeat orders

GARDNER

abrasive discs

BELOIT, WISCONSIN

G.T.M. reduces pickling tank maintenance by 66%

ALMOST weekly repair of a lead-lined, wooden pickling tank was a major problem for this Midwestern steel processor. Maintenance cost alone ran into the thousands of dollars every year. Moreover, the lead often stuck to the steel strip, causing additional problems.

Finally it was decided to install a steel tank. The G.T.M.—Goodyear Technical Man—recommended a PLIOWELD rubber lining plus two courses of acid-resistant brick. He also helped to develop a series of unique thermal expansion joints between the 40-foot tank sections. Result: *No shutdowns in two years,* except for normal cleaning—maintenance slashed to *one-third its former cost.*

Similar savings may be yours on any industrial rubber application by consulting the G.T.M. Contact him through your Goodyear Distributor, or write Goodyear, Industrial Products Division, Akron 16, Ohio.

PLIOWELD TANK LININGS by

GOODYEAR

THE GREATEST NAME IN RUBBER

Plioweld—T. M. The Goodyear Tire & Rubber Company, Akron, Ohio

IT'S SMART TO DO BUSINESS *with your Goodyear Distributor. He can give you fast, dependable service on Hose, V-Belts, Flat Belts and many other industrial rubber and nonrubber supplies. Look for him in the Yellow Pages under "Rubber Goods" or "Rubber Products."*

STEEL
The Metalworking Weekly

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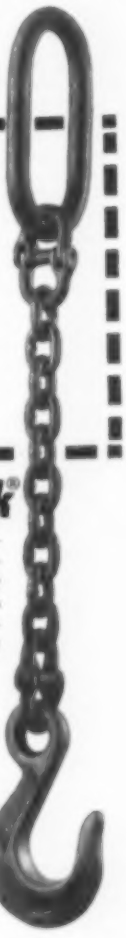

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ALTERNATE SUNDAY EVENINGS

YOUR GUIDE TO
THE BEST IN
ALUMINUM VALUE

ALCOA ALUMINUM

behind the scenes

Old Tars Available

Thanks to old Gen. Douglas MacArthur, we all know what happens to old soldiers. "They never die," said Mac, fumbling for his smoked glasses and oversized corncob pipe; "they just fade away."

That's well and good. But what happens to old sailors? Come to think of it, has anyone ever *seen* an old sailor? For no reason that we can think of, this brings to mind one particular old sailor who astonished us by speaking irritably from his tomb; at any rate, that's what the poet would have us believe. The Duke of Wellington was being laid away with pomp and ceremony, disturbing Nelson, who wanted to know what the commotion was all about. "Mighty seaman," said the poet, "this is he, was great by land as thou by sea!"

How would you like to be dead, and ask a civil question, and get a reply lacking a substantive qualifying pronoun? No wonder Nelson was irritable.

Cometh now another old sailor, one Capt. V. Havard Jr., U. S. Navy. Captain Havard is not concerned with tombs, drums or substantives: He is excited over STEEL's article "Top Jobs Go Begging" (May 14, p. 69). Picking up his pen (possibly the one that writes under water) the captain wrote: "I am one of a number of naval officers who will presently retire after 30 years' service. We are skilled executives, and many of us want industrial positions. We can fill many of the positions now 'Going Begging.' We are used to responsibility; we are skilled organizers; we are capable personnel handlers. As individuals, we had a basic engineering education."

Captain Havard and his ancient associates have an average age of 52. Members of the class of '26, they are due to be retired in June. They may be located through the Naval Academy Alumni Association, Annapolis, or confidentially through Shrdlu.

Soap Chips Vs. Machine Chips

Have you looked through the Jones & Lamson's "New Horizons" contest ad that has been running in STEEL lately? If you haven't, you must have been reading old copies of *Judge*, or *Harper's Illustrated Weekly*, because the announcement appears in full color on a two-page spread, featuring four breath-taking illustrations of Paris, the Caribbean, Hawaii and the Canadian Rockies. Contestants are invited to study Jones & Lamson machines, and then select about 150 words explaining why these machines are, in bebop argot, the most.

We usually associate soap people with these top flight contests. It's something novel for a metalworking manufacturer to adopt cosmetic sales techniques, and we wish them luck. And if 150 carefully selected eulogistic words about those machines will win us a two-week trip to Paris, the Caribbean, Hawaii or the Canadian Rockies, then shake hands with a contestant. (Editor's note: Shrdlu is not eligible; he doesn't know a Jones & Lamson machine from a gravimetric hygrometer.)

Lad Lays It on Line

Newman Ladabouche, STEEL's indefatigable circulation and research director, folded himself together like a pocket knife to facilitate his entrance into our coop, and slyly dropped the following verse before our small, criminal type eyes. "Deathless poetry," he whispered, "for your audience. That is, if you have any audience."

They said it couldn't be done,
But he, with a smile, replied
That maybe it couldn't; he'd not be one
To say, at least until he tried!
So, with a bit of a grin
He pitched right in,
. . . . . And he couldn't do it!

Last Lines

There were some delightful, but unprintable, last lines submitted for our "Copy to Incite" limerick about the steel pricing estimates. Best of the lot was, "Estimating's taboo! GUESSTIMATE!" by Paul Rodman, Aluminum Specialty Co., Iron Mountain, Mich.

Shrdlu

(Metalworking Outlook—Page 61)

ANOTHER SCIAKY FIRST . . .

PRECISION CONTROL

for Resistance Welding as accurate as the time signals of the U. S. Naval Observatory

Now, Satisfy Your Most Rigid Production Standards on Long or Short Runs

The Sciaky Predetermined Electronic Counter Weld Control employs a Dekatron tube to count the cycles of power line frequency and impulses of secondary current in predetermined absolute numbers and without deviation. Since power line frequency is maintained by reference to Naval Observatory time signals, you get these same standards of accuracy with the new Sciaky Control. Welder functions are *CENTRALIZED* — only one Dekatron tube is used to control succeeding functions such as "squeeze, weld, hold, and off".

The Sciaky Predetermined Electronic Counter Weld Control is absolutely consistent. Positive adjustment snap switch control dials are calibrated in cycles and impulses. You set the number of cycles and impulses you want and you get them throughout the longest or shortest run—and you can easily reproduce them at any time.

Unitized, plug-in sub-assembly units are used to simplify maintenance and make it possible to add welder functions easily. In either case, down time is limited to the few minutes it takes to plug in a spare assembly or the additional units desired.

To find out more about this revolutionary new control ask to see your Sciaky Sales Engineer or write for Bulletins No. 338 and No. 339. There's no obligation.

SCIAKY BROS., INC.,
4909 W. 67th St., Chicago 38, Ill.
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Sciaky Roll Spot and Seam Welder equipped with the Sciaky Predetermined Electronic Counter Weld Control.

Largest Manufacturers of Resistance Welding Machines in the World

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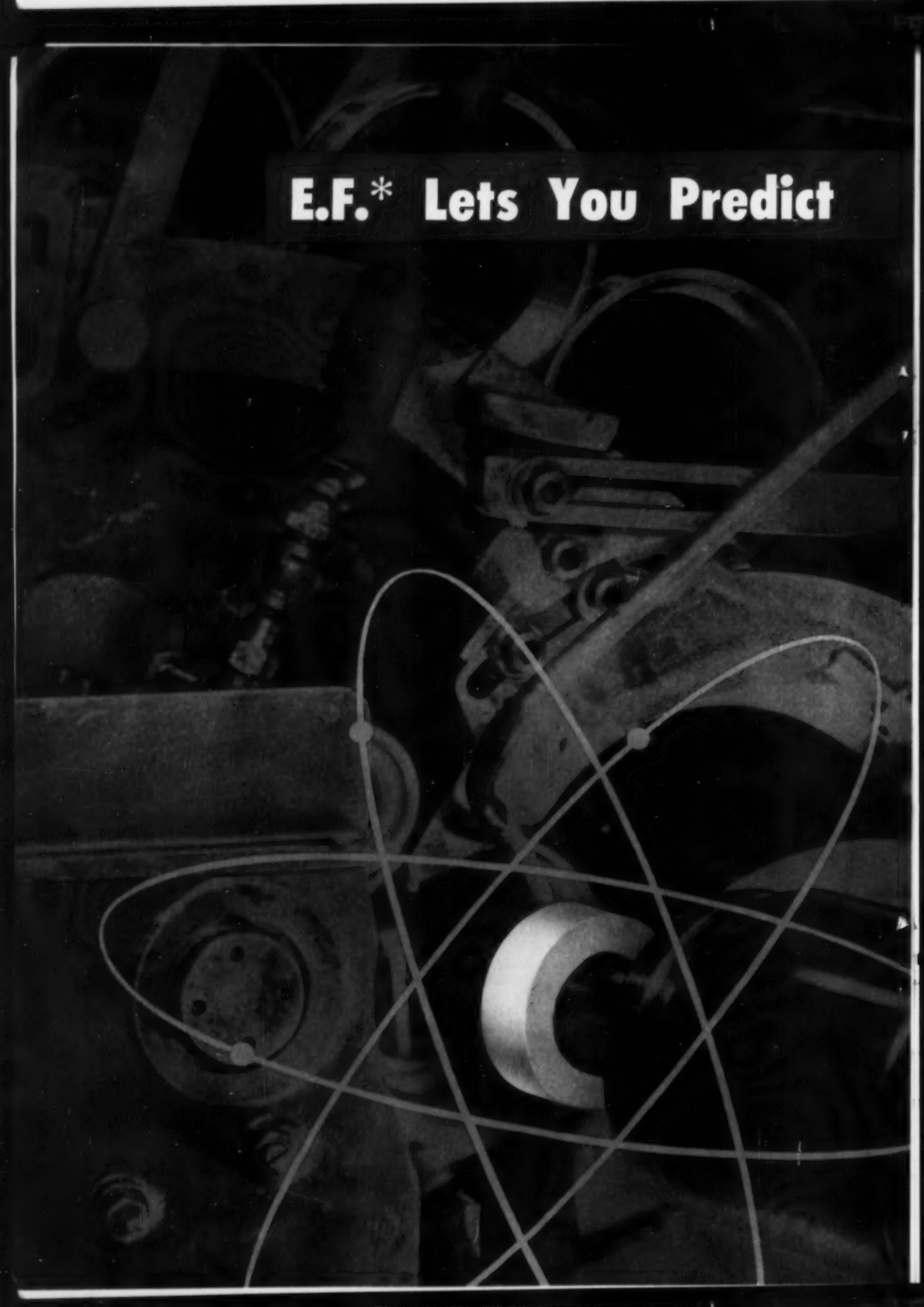
E.F.* Lets You Predict

Grinding Wheel Performance

***ELECTRONIC FORMULATION is a basic manufacturing improvement which makes grinding wheel accuracy equal to the precision of automated production.**

When the output of machines like this centerless internal grinder feeds a production line . . . grinding wheels *must* maintain their prescribed production rates!
BAY STATE'S "EF" lets you predict such dependable grinding action because it offers:

GREATER ACCURACY in selecting the right wheel for the finish and production rate you need.
"EF" is based upon a new, straight-line progression of wheel hardnesses and structures. Specifications can be pin-pointed on this basic line within much closer tolerances.

GREATER DEPENDABILITY of cutting life, giving a more reliable basis for predicting production per wheel.

"EF' uses the unerring accuracy of an electronic "brain" to calculate *precise* amounts of each ingredient. These determine the grade and structure, hence the *performance* of the finished wheel.

GREATER UNIFORMITY in cutting qualities of replacement wheels, for continuous production at most efficient rates.

"EF" retains essential formula figures in the perfect "memory" of electronically punched cards. This assures identical duplication of materials in reproducing the wheels prescribed for your needs.

GREATER CONSISTENCY in grade and structure, for steady flow of parts at "within tolerance" finish and dimensions.

"EF" has established the most accurate standards by which grinding wheels can be specified, produced, and reproduced. It is your most logical source of complete confidence in production grinding wheels.

Get ALL the E. F. benefits
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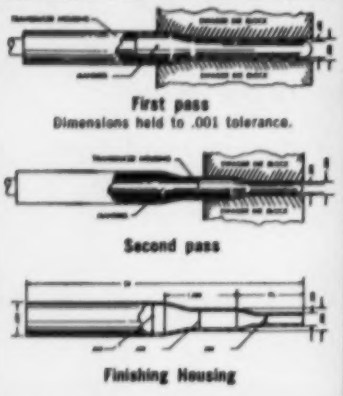
Distributors — All principal cities
In Canada: Bay State Abrasive Products Co. (Canada) Ltd., Brantford, Ont.

ARE YOU MACHINING **when you should be SWAGING?**

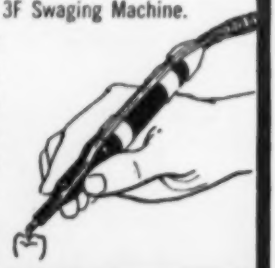
SWAGING TRANSDUCER HOUSING



How SWAGING cuts costs 80% on Transducer Housing

The Cavitron Ultrasonic Dental Unit provides a marvelous new method for preparing cavities without noise, vibration and heat which contribute so greatly to dental pain and discomfort. Internal dimensions of the transducer housing are critical. A mating cap requires the outside diameter to be rigidly held as well. This housing was formerly machined in two parts and silver brazed together. Now, it is made in one piece from tube stock in 2 passes on a Fenn Model 3F Swaging Machine.

RESULT — Cavitron has not only reduced cost of the Transducer Housing 75% to 80% but now has a simplified one-piece housing that is stronger, easier to make and with a smooth, bright surface resulting from swaging which requires no additional finishing. Write for catalog and full information.



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LETTERS
TO THE EDITORS

Data on Steel Tonnage

Can you furnish data showing steel tonnage produced by the major U. S. and Canadian steel companies for 1950-1955?

W. F. Hartman
Sales Production Manager
McLain Fire Brick Division
H. K. Porter Company Inc.
Pittsburgh

• *Total steel ingot production for the U. S. and Canada is shown on page 150 of the insert, "1956 Metalworking Facts and Figures" (Jan. 2). Ingot production figures for the leading U. S. companies are shown in* STEEL*'s annual financial analyses of the steel industry, but we have no similar breakdown for Canadian companies. We are forwarding these reprints.*

Addendum to Bolt Story

In the article, "Structural Fasteners: Four To Choose From" (May 21, page 112), the data listed under the Dardelet Rivet-Bolt column are applicable to all ribbed bolts. The heading was intended to include all bolts with shanks that are fluted or ribbed and with strength characteristics comparable in value.

Values listed for "allowable shear" are those for a ¾-in. bolt and rivet.

John B. Scalzi
Associate Professor of Structural Engineering
Case Institute of Technology
Cleveland

Editorial Motivates Comment

I have just read the editorial, "Please the Customer" (May 21, page 67), in which a description of the car in the near future is given.

I'm off auto engineers and designers; the auto is, in my opinion, a big joke designwise.

Only today, at long last, are we approaching the power and smoothness the Stanley Steamer had 40 years ago! It would do 127 miles an hour. It had a silent, silky, gearless drive that is only approximated in cars driven by internal explosion engines. Thank heaven, we may have to return to steam if we decide to power our cars with the atom.

Visually, the present cars are monstrosities. In their "lines," they resemble something that might have been worked out in an institution for the feeble-minded. They all look alike—crazy. The front end has been tinkered with, from time to time, till, coming toward you, it resembles a big, sloppy mouth, full of buck teeth!

And one slight bang knocks from $25 to $50 out of your insurance company which goes onto next year's rates.

You can't keep the windows clean

(Please turn to page 12)

THEY "SKIN" STEEL TUBES to put PEP in this DIESEL!

Courtesy: Van der Horst Corp. of America

This powerful diesel loses its pep when cylinder liners become excessively worn. Formerly, this reoccurring ailment called for reboring — an operation that reduced the liner wall and its mechanical strength. In time, costly castings had to be scrapped. Now — a unique application of Frasse tubing helps put them back in service . . . indefinitely! Here's how.

By means of a newly developed electrolytic bath, the bore of the worn liner is plated with a precise layer of pure iron etched from the surface of a steel tube. It is then restored to original size — ready for service again.

The success of this precision plating operation depends on quality tubing that is dimensionally uniform. Frasse tubing — from warehouse stock — has met this rigid requirement for many years *without a single rejection.*

There is no fear of non-uniformity when you work with Frasse tubing. You get the same trouble-free quality with every order. And, remember Frasse tubing specialists are available to consult with you in applying tubing to your product advantageously, or in solving a tube problem. Whenever you need tubing — you'll be pleased with the extra services you get — simply by calling Frasse.

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Seamless and Welded Mechanical Tubing
Pressure, Condenser and Hydraulic Tubes
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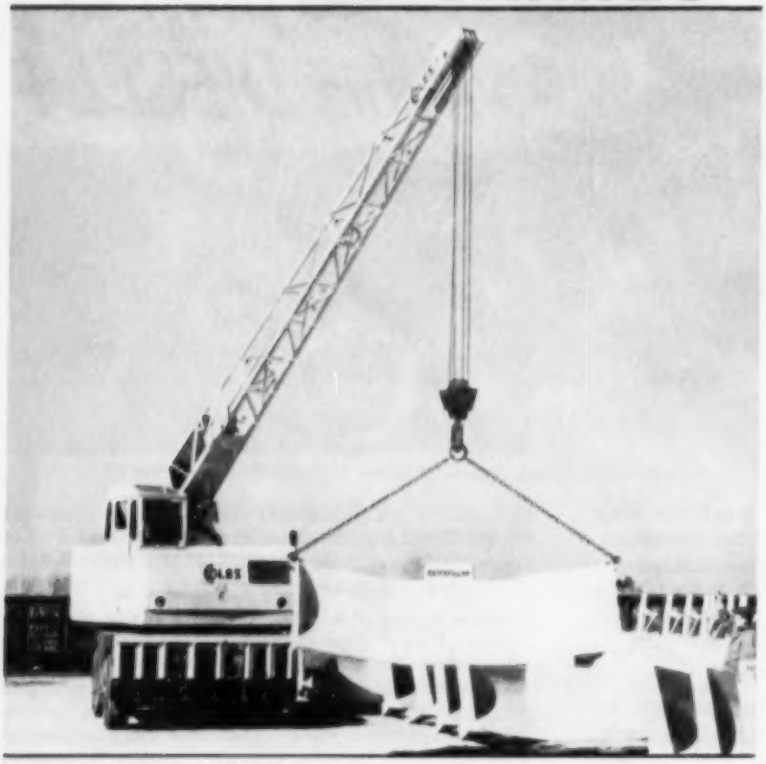
Cut costs 101 ways*

COLES CRANES



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Now — AVAILABLE L. P. GAS-EQUIPPED

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- **Shortest turning radius of any full circle slewing mobile crane**
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ACCURATE SPOTTING: All loads lowered under power for careful placement. Safety devices are integral with a COLES.

SMOOTH POWER: COLES develop highest torques at lowest revs for controlled, balanced power.

LETTERS

(Concluded from page 10)

in the winter. If your choke doesn't work, you have to churn heck out of your battery or sit and wait for the overflow to evaporate. You can't push a lever and drain or blow it out. And gears still freeze in the best of makes.

I'll take a 'copter for mine.

Claude Schaffner
New Haven, Conn.

Request from Belgium

We are interested in the article, "Scale-Free Heating in a Direct-Fired Furnace" (Mar. 5, page 105). Please furnish us with more information about this new system and, especially, about the Equiverse furnace.

L. Cantiniau
Secretary General
Societe Anonyme des Usines Gilson
La Croyere, Belgium

• *Contact Horace Drever, president, Drever Co., Bethayres, Pa.*

Likes Steel Buyers' Guide

On July 19, 1948, you published the report, "Guide for Steel Buyers." I have found this helpful. If you have copies still available or if you have a more recent publication, I would appreciate several copies.

J. P. Doyle Jr.
General Manager-Operations
Southern States Iron Roofing Co.
Atlanta, Ga.

• *The most recent guide was published July 12, 1954. It sells for $1 per copy.*

Stainless Story to Committee

I was interested in the article, "New Vistas for Stainless" (Apr. 30, page 92). Since our Critical Materials Conservation Committee is much concerned with this subject, I would appreciate receiving 14 copies to distribute to the members.

Franklin P. Huddle
Conservation Specialist
Office of the Assistant
Secretary of Defense
Washington

Statistics on Silicon Steel

We are interested in obtaining statistics on capacities of steel mills producing electrical grade silicon steel.

H. J. Webb
Moloney Electric Co.
St. Louis

• *Details of mill capacity to produce silicon steels for electrical purposes are incomplete, but the latest figures on capacity (as of Jan. 1, 1954) for eight of the mills are in the* 1954 Directory of Iron & Steel Works of the U. S. and Canada, *issued by the American Iron & Steel Institute, 350 Fifth Ave., New York 1, N. Y.*

These producers are: Wheeling Steel Corp., Empire Steel Corp., Newport Steel Corp., Mallory-Sharon Titanium Corp., U. S. Steel Corp., Republic Steel Corp., Granite City Steel Co. and Inland Steel Co.

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making available to bustling industrial areas a vast pool of integrated skill and research—through separate, complete operating Divisions.
Factory-trained sales and engineering field men.
Design literature available on all types of springs.

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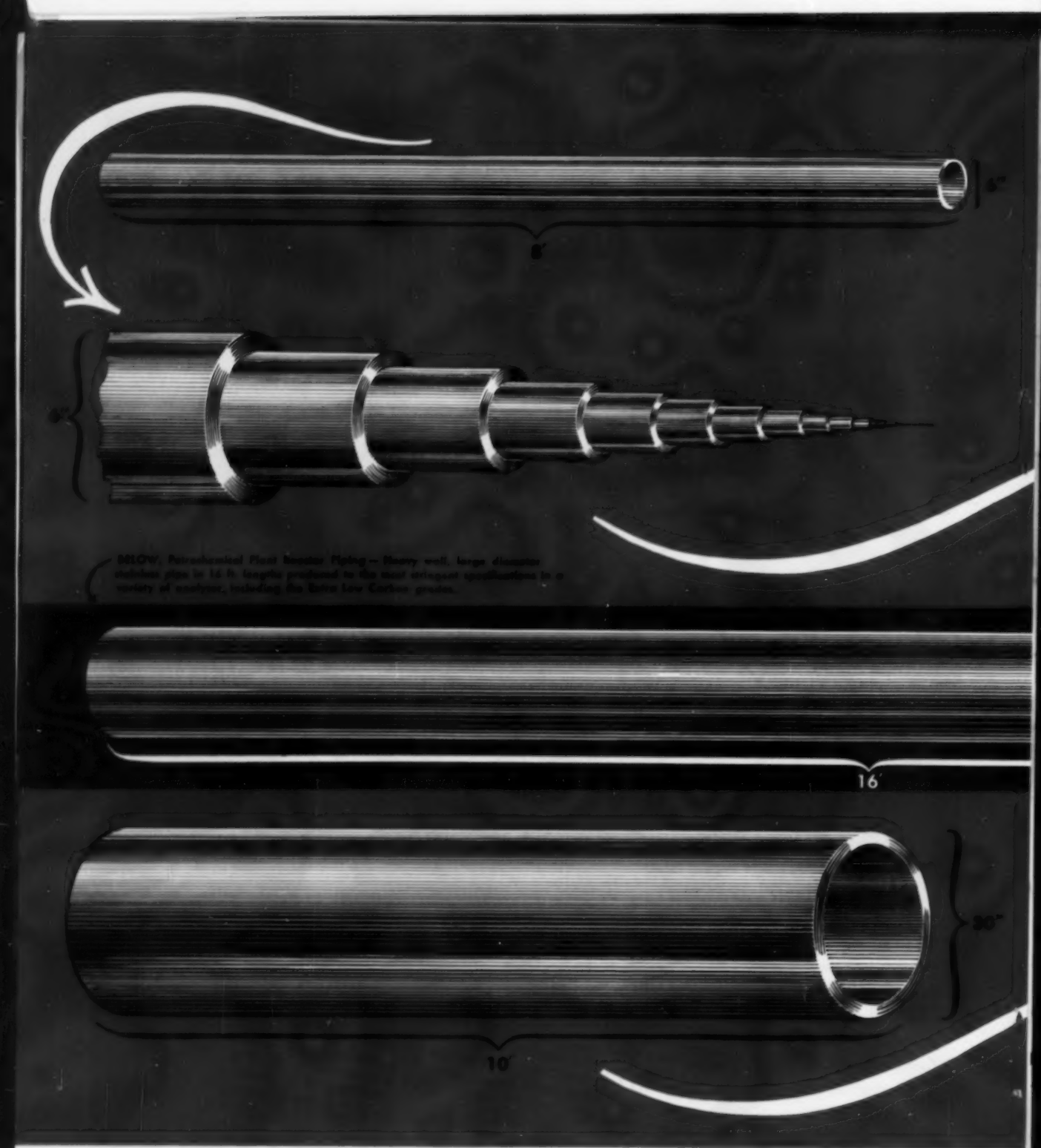

BELOW, Petrochemical Plant Reactor Piping — Heavy wall, large diameter stainless pipe in 16 ft lengths produced to the most stringent specifications in a variety of analyses, including the Extra Low Carbon grades.

UNITED STATES PIPE & FOUNDRY CO.

Steel and Tubes Division

STEEL AND TUBES DIVISION USP

BURLINGTON, NEW JERSEY

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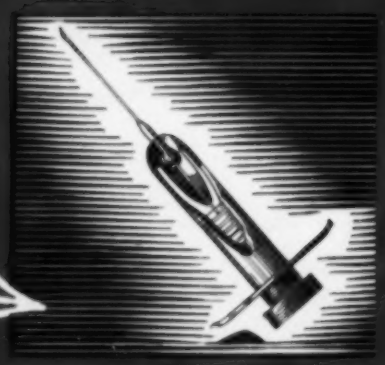
3 PROBLEMS
each different

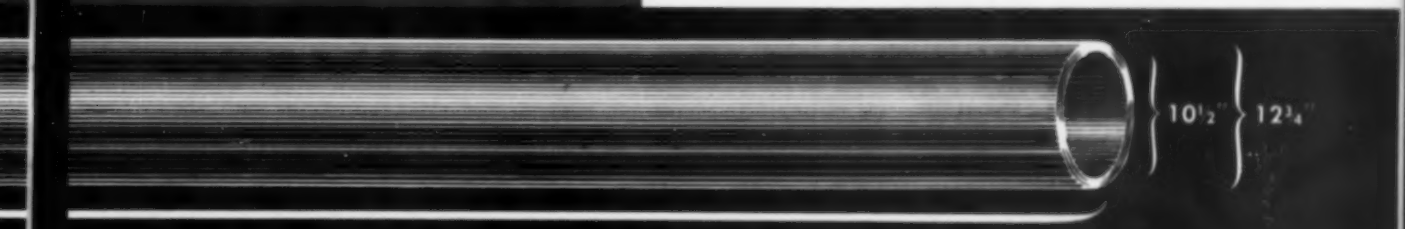
1 SOLUTION...
stainless steel
Centrifugal Castings

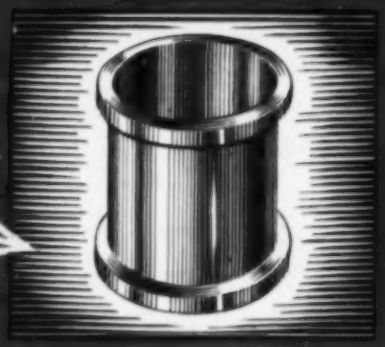


Hollow billets for cold reducing into small diameter seamless tubing, even down to hypodermic needles—ultimate proof of metal soundness! Heavy to-called non-piercable grades of pipe and tubing can be hot or cold reduced from centrifugally cast billets.

Heavy Wall stainless steel pipe, centrifuge bowls, hollow billets for finely drawn hypodermic needle tubing . . .

These are among the many end uses for metal mold centrifugally cast cylindrical shapes. They are typical of the exacting, difficult service conditions to which this product is subjected. All three examples shown demonstrate the fundamental versatility of this manufacturing process—unequaled product soundness—from hypodermic needle stock subjected to the repeated stresses of cold reduction, to the centrifuge bowl spun





Centrifuge Bowl Shells processed from multiple length sections and machined to shape desired.

at 1800 RPM, to the petrochemical plant reactor piping that must pass hydrostatic pressure tests equal to 90% of the Yield Strength of the metal. These are the proving grounds of quality—of the ability to meet even the most exacting of product specifications.

We welcome your inquiries. For descriptive literature on the versatile metal mold process, write to United States Pipe and Foundry Company, Steel and Tubes Division, Burlington, N. J.

Study these advantages for your cylindrically-shaped products

- Reduced processing time and increased production.
- Design of parts to suit the specific job requirements by selecting the correct alloy – not the next best available alternate.
- Conservation of expensive metals and alloys – especially on tubular parts now produced from solid sections.

SIZE RANGE AND COMPOSITION FLEXIBILITY

Outside Diameter—4" to 48"

Wall Thickness—⅜" and up

Length—Up to 16' in the "as-cast" condition

Types of Stainless Cast—All Standard AISI and ACI grades of ferritic and austenitic stainless, including No.20 Alloy, 17-4 P H, 17-7 P H and E.L.C. grades.

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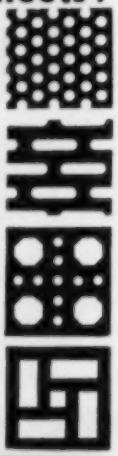
Need Holes in Metal Sheets?



Several considerations must usually be observed. The design should be attractive in appearance and the percentage of open area should be adequate while, at the same time, affording suitable concealment of what lies behind or underneath. Naturally, also, the right metal should be used in the right thickness.

Whenever Perforated Metal is required, and it has thousands of applications today, you'll do well to contact Diamond. Forty years of widely diversified experience and hundreds of modern tool arrangements enable us to give unsurpassed service and delivery. Catalog 29 (32 large pages) gives complete illustrated information. No charge or obligation.

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Box 32 WYOMING (Wilkes-Barre Area) PENNA.

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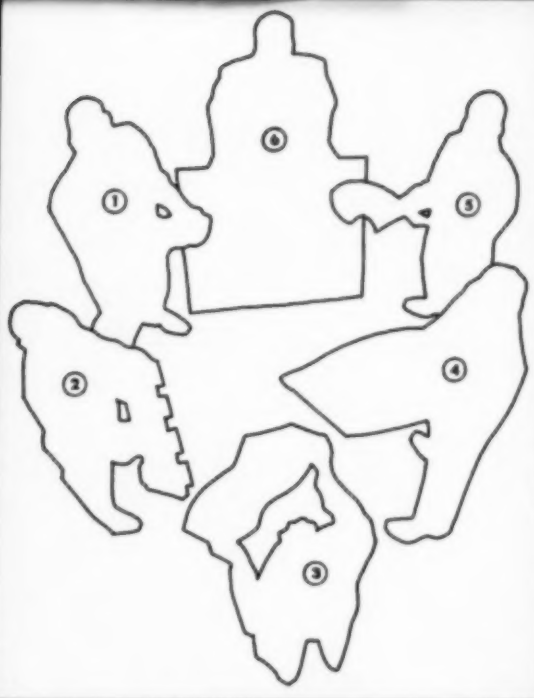
GRUELING DEMOLITION CONTEST FAILS TO FLAKE TI-CO!

STOCK CAR DRIVER inspects sheet of Ti-Co after battering in demolition race. No trace of coating failure could be found.

The brutal "demolition race" is one of the top crowd-pleasers in stock car racing. Each driver is bent on smashing his opponents out of the race . . . last car still moving is the winner! This grueling automotive mayhem at Chicago's Soldier Field provided the setting for an unusual demonstration of the toughness of the zinc coating on Inland Ti-Co galvanized sheets. A sheet of Ti-Co was lashed to the rear of one of the doomed jalopies. Car after car rammed it head-on, at speeds up to 50 m.p.h. After half an hour of constant crashing, battering punishment, the car was finally ready for the junk heap . . . but the zinc coating on the Ti-Co sheet had stayed put! Closest examination revealed not a trace of coating failure anywhere.

This test is, to be sure, rather unusual . . . but the Ti-Co coating has survived even tougher tests without cracking, flaking or peeling. Turn the page for more facts about how Ti-Co can cut your manufacturing costs, improve your products and add greatly to their useful life.



Shown (at the left) are six typical severe forming jobs now being accomplished with Inland Ti-Co: (1) deep-drawing, (2) roll-forming, (3) Pittsburgh lock-seaming, (4) spin-drawing, (5) crimping, (6) perforating.

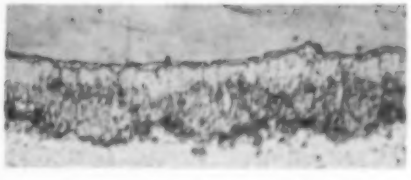
INLAND TI-CO GALVANIZED SHEETS TAKE THE TOUGHEST FORMING OPERATIONS IN STRIDE

Any product that can be formed with steel can be formed with Inland Ti-Co. Ti-Co's ability to withstand even the most severe forming without cracking of the zinc coating makes possible many new galvanized steel products.

The zinc coating on Ti-Co is not only extemely tough but has just enough pliability to actually flow with the base metal as it's formed. Both on the production line and in extended usage, the Ti-Co coating has proved its ability to withstand punishment without leaving the slightest opening for rust to get a foothold. Unlike the conventional galvanized, products made from Ti-Co do not require re-dipping or "touch-ups" after fabricating, and rejects are greatly minimized. Ti-Co products can be depended upon for long service.

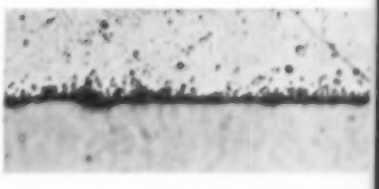
THE SECRET OF INLAND'S NON-FLAKING TI-CO

Inland Ti-Co galvanized steel is made by the patented Sendzimir process, a continuous operation in which the heat treatment of the strip and the application of the zinc coating are performed in one continuous galvanizing line. This process eliminates the brittle iron-zinc alloy layer, that causes flaking in conventional galvanized sheets, and results in production of a sheet on which the zinc adheres so tightly that it can be severely formed without flaking of the coating.



Photomicrograph reveals hard, brittle iron-zinc alloy layers which cause flaking in conventional galvanized steel.

Alloy layers are virtually eliminated in galvanized sheets made by the Ti-Co continuous process of galvanizing.



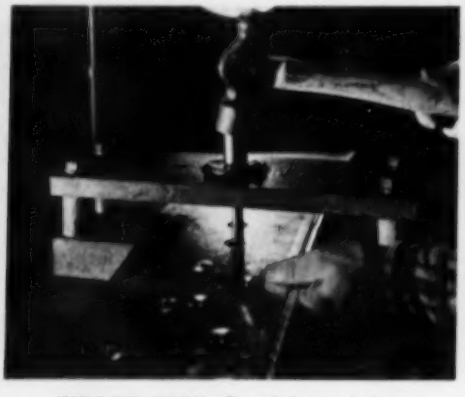
WHY YOU CAN BE SURE OF TI-CO'S QUALITY

Samples from every order of Ti-Co are put through a series of tests far more severe than ever demanded of a galvanized sheet in normal fabrication.

In addition to the coating tests shown below, the Ti-Co quality control routine includes the following tests: Olson Cup test for ductility; Rockwell Hardness test; Weight for Coating test for uniformity; Fluting test of resistance to cross-breaking; Microstructure test for tightness of coating.

HOW YOU CAN TEST TI-CO. Take a piece of the galvanized steel you are now using and bend it back and forward on itself several times. If the coating flakes or peels, it's *not* Ti-Co. For a free sample of Ti-Co to use in making your own "bend test" comparison, please write to Department 297.

LOCK SEAM TEST. The tough 180° bend of a Pittsburgh lock seam is a supreme test of fabricating qualities. Ti-Co takes it!



IMPACT TEST. Rounded punch hammered into Ti-Co sheet dents the steel. But the Ti-Co coating "gives" without cracking.

BEND TEST. Hammered flat to a 180° bend, the Ti-Co coating shows no sign of cracking or flaking after repeated pounding.

INLAND STEEL COMPANY

38 South Dearborn Street • Chicago 3, Illinois

Sales Offices: Chicago • Milwaukee • St. Paul • Davenport
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INLAND
TI-CO
®

exclusive double lube protection for new top drive full eccentric presses

New from Hamilton . . . two major mechanical press developments in one . . . a complete new line of welded steel, top drive, full eccentric presses from 300 to 4000 tons . . . an exclusive new double lube system protects each press for extra-long, trouble-free service and for smoother, precision performance.

Hamilton double lube is a combination of a carefully engineered pressure oil lubrication system PLUS a complete set of troughs and gravity flow channels to provide gravity lubrication. All bearings are positively lubricated even if pressure and flow switches should fail. Double lube is double insurance against lubrication failure—a major cause of costly downtime.

In addition, this line features Hamilton's new air clutch, which combines all the advantages of two types . . . low inertia and mechanical interlocking.

Hamilton—pioneer of the giant automotive stamping presses—meets today's demand for higher quality, faster production, less downtime. Put this know-how to work for you! Send for the full story. Write Dept. 4446, Hamilton Division, BLH Corporation, Hamilton, Ohio.

BALDWIN BLH LIMA-HAMILTON

HAMILTON DIVISION
BALDWIN-LIMA-HAMILTON

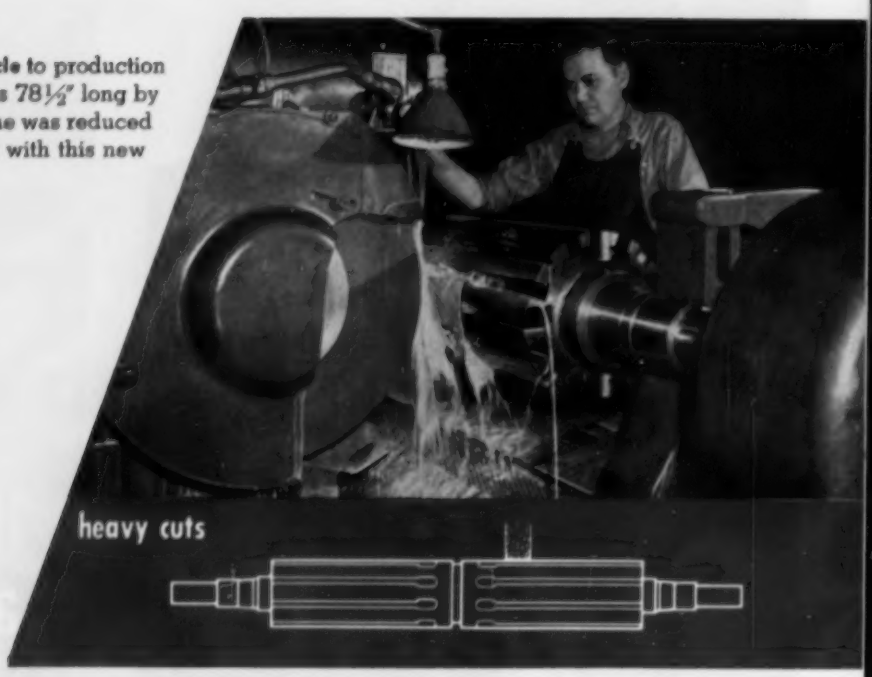
DIVISIONS: Austin-Western • Eddystone Electronics & Instrumentation • Lima • Hamilton • Loewy-Hydropress • Pelton • Madsen • Standard Steel Works

You Can Get Results Like These

from modern Landis

heavy cuts

Interrupted cut no obstacle to production of these slotted cylinders 78½" long by 13⅝" O.D. Grinding time was reduced from 7 hours to 6 hours with this new Landis grinder.



LANDIS 24" x 120" type FR Roll Grinder
Detailed specifications in Catalog F-48.
Send for your copy today.

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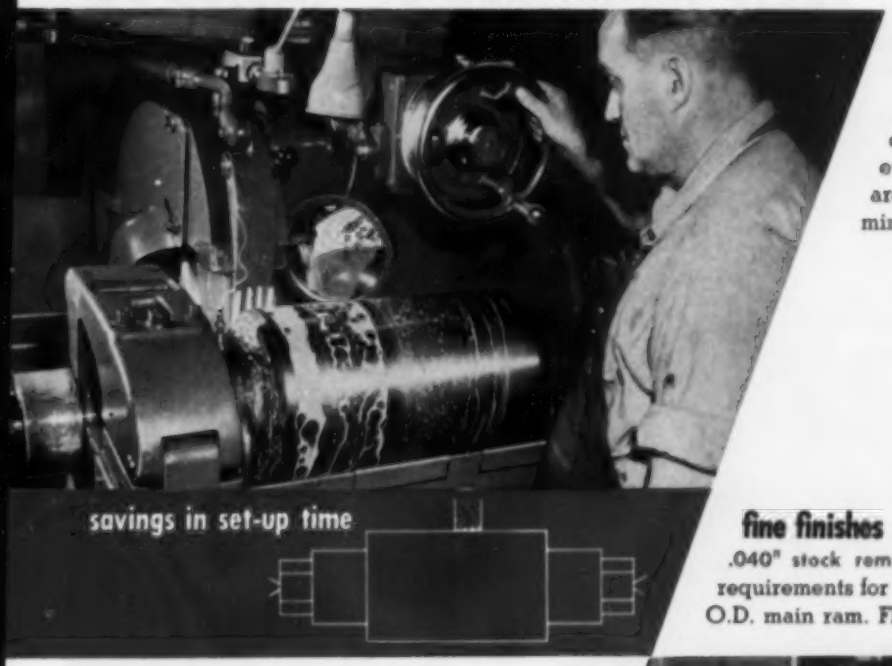
precision grinders

type FR Roll Grinders . . .



savings in set-up time

savings in set-up time

Regrinding roll for cold rolling operations. Patented crowning mechanism insures exact duplication of crowning setting on every job. Rolls have 20" face and are 12" O.D. Grinding time is 20 minutes floor-to-floor.

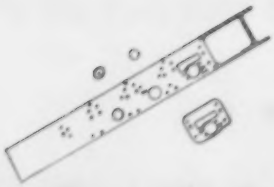
fine finishes

.040" stock removal to 6 micro inch finish are requirements for grinding this 32⅝" long by 13" O.D. main ram. Floor-to-floor time is 4 hours.

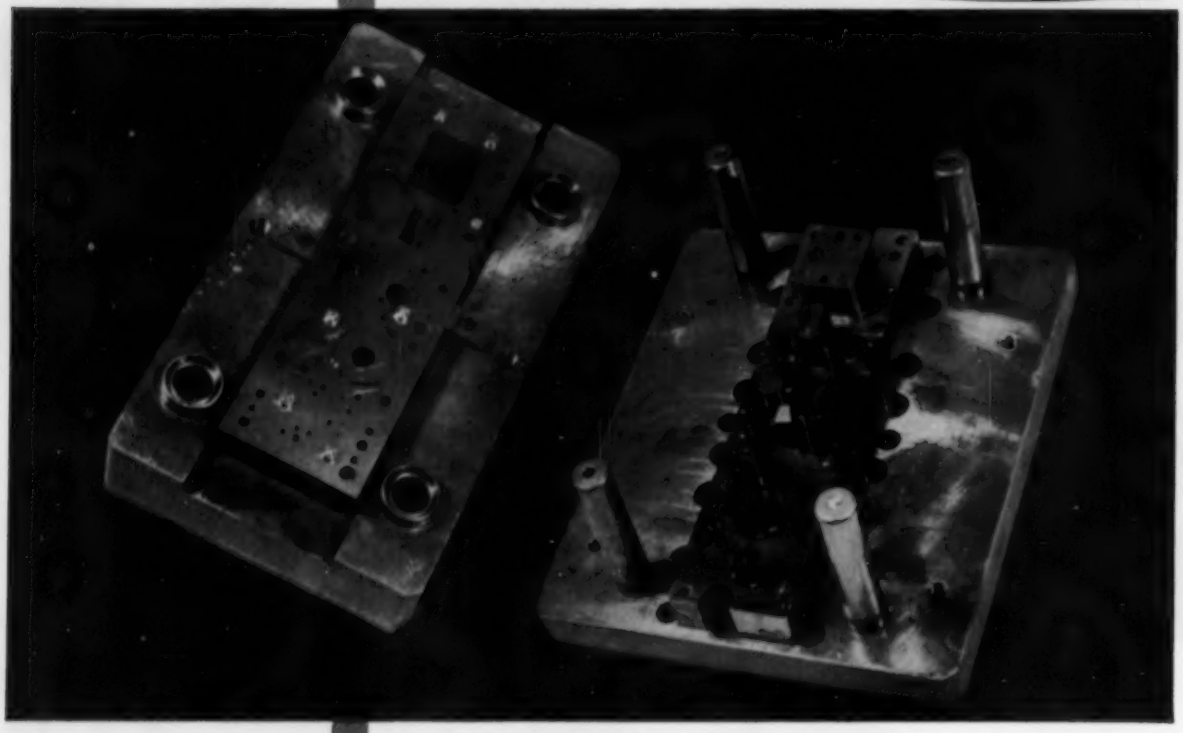
fine finishes

150

LANDIS TOOL COMPANY / WAYNESBORO, PENNA., U. S. A.



This HURON Lamination Die Gave Initial Run of 426,000!



Write for BLUE SHEET on HURON

This concise four-page folder gives all needed handling and shop treatment details on Huron. Included is certified laboratory information on physical characteristics, and complete data on forging, annealing, hardening, tempering, etc. *Ask for your copy.*

Address Dept. S-78

LUDLUM HURON high-carbon, high-chrome die steel was the material used in this motor lamination die. Here was the result when the die was run on a 45-ton Bliss press at 210 strokes a minute:

1. Initial run was 426,000 pieces
2. Average run since has been 250,000 pieces
3. Although burr tolerance is .003", grinding of punch and die between runs has not exceeded .008"

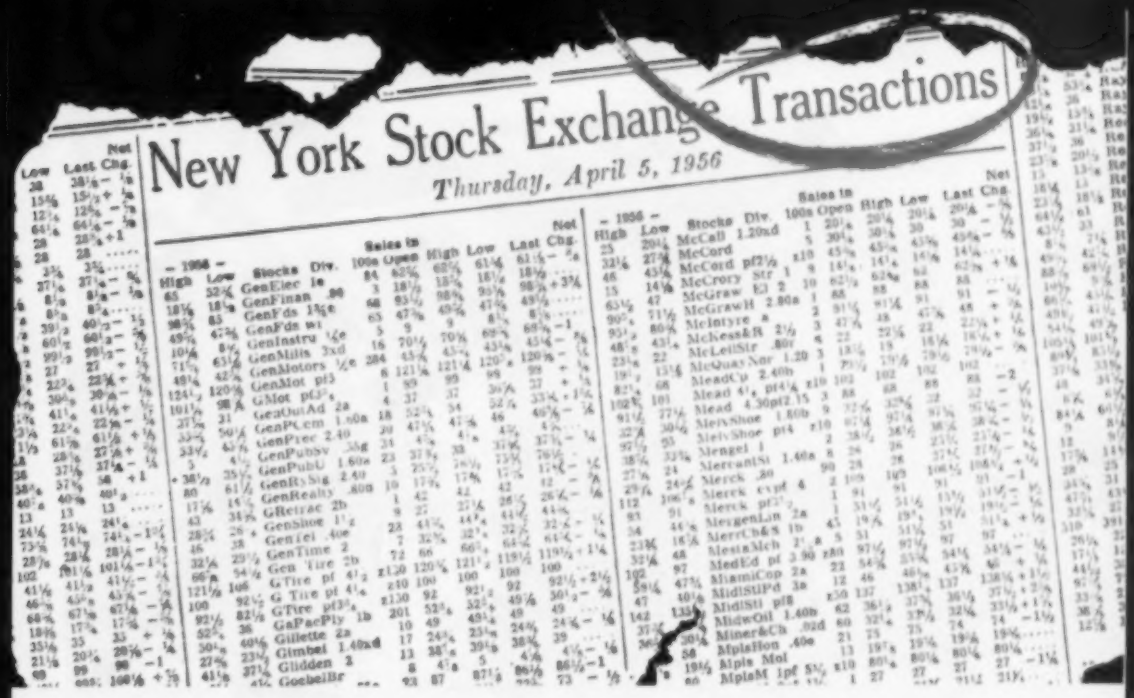
LUDLUM HURON WAS SELECTED because of its known high resistance to wear, especially under heavy pressures, and its excellent non-deforming qualities. Because Huron is an oil-hardening steel and hardens uniformly to a great depth, a consistent production rate after each grind was assured.

There's an A-L Tool Steel that will help solve your cutting, forming or blanking problem. Call our nearest office or distributor today, or write *Allegheny Ludlum Steel Corporation, Oliver Bldg., Pittsburgh 22, Pennsylvania.*

For complete **MODERN** Tooling, call

Allegheny Ludlum

AL FINE TOOL STEELS SINCE 1854


New York Stock Exchange Transactions

Thursday, April 5, 1956

NONE...without brick!

That's right—NONE! No sales . . . no profits . . . no financial page . . . no industry. *You* would have nothing to make . . . buy . . . sell . . . or transport were it not for refractory brick.

Because everything made . . . everything that moves owes its very existence to refractories.

Refractories, you see, are born in many shapes and of many compositions to do a variety of jobs. It's brick and high-temperature refractory mortars, plastics, castables, and bulk products that prison temperatures of thousands of degrees for industry.

General Refractories, making and distributing exactly the right refractory to industries everywhere, maintains the world's largest refractories laboratory and draws resources from all over the globe.

A Complete Refractories Service

GENERAL REFRACTORIES COMPANY

Philadelphia 2

A COMPLETE REFRACTORIES SERVICE FOR THE STEEL INDUSTRY

OLIVE HILL BF and OLIVE HILL HI-FIRED brick rank high in any list of prominent and widely used brands of blast furnace refractories. Manufactured from dense-burning Kentucky flint fire clays by Grefco's unique manufacturing processes, OLIVE HILL brick set a standard for blast furnace refractory quality and workmanship.

Grefco processing of OLIVE HILL brick entails:

1. Careful selection, testing, stockpiling and blending of fire clays to insure uniform raw material quality.
2. Grinding and screening to prescribed formula to promote high density of product.
3. Efficient deairing during brick forming, also to promote density and proper physical structure.
4. Careful firing to exacting temperature schedules to yield uniform high quality brick.
5. Close inspection of final product with gauging and sorting of brick to close size tolerance.
6. Quality control by statistical analysis procedures for the manufacturing processes.

In service, OLIVE HILL blast furnace brick, both BF and HI-FIRED, have produced many splendid performance records in the past. OLIVE HILL linings in presently operating furnaces, are giving outstanding performance and are more than meeting the increasing requirements of the expanding American Iron and Steel Industry.

GENERAL REFRACTORIES

Here's quality in a wide variety . . . and it starts with the basic material

. . . YOUNGSTOWN COLD FINISHED BARS

Lamson & Sessions bolts, nuts and cap screws have established a world-wide reputation as fasteners of quality and dependability. To gain such a reputation is not accidental. It is, rather, the result of careful planning, exact selection of materials and precision manufacturing. The basic material, as an example, is Youngstown Cold Finished Bars.

The uniformly high quality of Youngstown Cold Finished Bars makes possible uniform products. It is a uniformity that starts in the Bessemer or Open Hearth and is maintained throughout manufacture. Composition, structure and surface conditioning combined with "know how" in cold finishing, assure the highest quality. Specify Youngstown - - your best assurance of quality.

QUALITY YOUNGSTOWN SERVICE

Youngstown

COLD FINISHED BARS

THE YOUNGSTOWN SHEET AND TUBE COMPANY *Manufacturers of Carbon, Alloy and Yoloy Steel*

General Offices Youngstown, Ohio District Sales Offices in Principal Cities.

SHEETS - STRIP - PLATES - STANDARD PIPE - LINE PIPE - OIL COUNTRY TUBULAR GOODS - CONDUIT AND EMT - MECHANICAL TUBING - COLD FINISHED BARS - HOT ROLLED BARS - WIRE - HOT ROLLED RODS - COKE TIN PLATE - ELECTROLYTIC TIN PLATE - BLACK PLATE - RAILROAD TRACK SPIKES - MINE ROOF BOLTS

CALENDAR
OF MEETINGS

June 11-12, Malleable Founders' Society: Annual meeting, Homestead, Hot Springs, Va. Society's address: 1800 Union Commerce Bldg., Cleveland 14, O. Secretary: Lowell D. Ryan.

June 11-15, Society of the Plastics Industry Inc.: National plastics exposition, Coliseum, New York. Society's address: 67 W. 44th St., New York 36, N. Y. Executive vice president: William T. Cruse.

June 12-14, Radio-Electronics-Television Manufacturers Association: Annual meeting, Edgewater Beach hotel, Chicago. Association's address: 777 14th St. N.W., Washington 5, D. C. Secretary: James D. Secrest.

June 17-21, American Electroplaters Society: Annual meeting, Hotel Statler, Washington. Society's address: 445 Broad St., Newark, N. J. Secretary: P. F. Kovatis.

June 17-21, American Society of Mechanical Engineers: Semiannual meeting, Hotel Statler, Cleveland. Society's address: 29 W. 39th St., New York 18, N. Y. Secretary: C. E. Davies.

June 17-22, American Society for Testing Materials: Annual meeting and apparatus exhibit, Chalfonte-Haddon Hall, Atlantic City, N. J. Society's address: 1916 Race St., Philadelphia 3, Pa. Executive secretary: Robert J. Painter.

June 19-22, Aviation Distributors & Manufacturers Association: Summer meeting, Grove Park Inn, Asheville, N. C. Association's address: 1900 Arch St., Philadelphia 3, Pa. Executive secretary: H. Donald Richards.

June 20-22, American Marketing Association: National conference and exhibit, William Penn hotel, Pittsburgh. Information: E. M. Strauss Jr., chairman, Aluminum Co. of America, Pittsburgh 19, Pa.

June 24-26, Alloy Casting Institute: Annual meeting, Homestead, Hot Springs, Va. Institute's address: 32 Third Ave., Mineola, N. Y. Executive vice president: E. O. Schoefer.

June 24-27, Drop Forging Association: Annual meeting, Homestead, Hot Springs, Va. Association's address: 419 E. Walnut St., Lansing, Mich. Executive vice president: Edgar L. Harden.

June 25-26, Atomic Industrial Forum Inc. and Denver Research Institute: National atomic energy conference, Denver Research Institute, Denver. Information: D. J. Scherer, Atomic Industrial Forum Inc., 260 Madison Ave., New York 16, N. Y.

June 25-29, American Institute of Electrical Engineers: Combined summer and Pacific general meeting, Fairmont hotel, San Francisco. Institute's address: 33 W. 39th St., New York 18, N. Y. Secretary: N. S. Hibshman.

June 28-July 1, American Coal Sales Association: Annual meeting, Greenbrier, White Sulphur Springs, W. Va. Association's address: 1625 Eye St. N.W., Washington 6, D. C. Executive vice president: W. W. Bayfield.

July 19-20, Truck-Trailer Manufacturers Association Inc.: Summer meeting, Edgewater Beach hotel, Chicago. Association's address: 710 Albee Bldg., Washington 5, D. C. Managing director: John B. Huise.

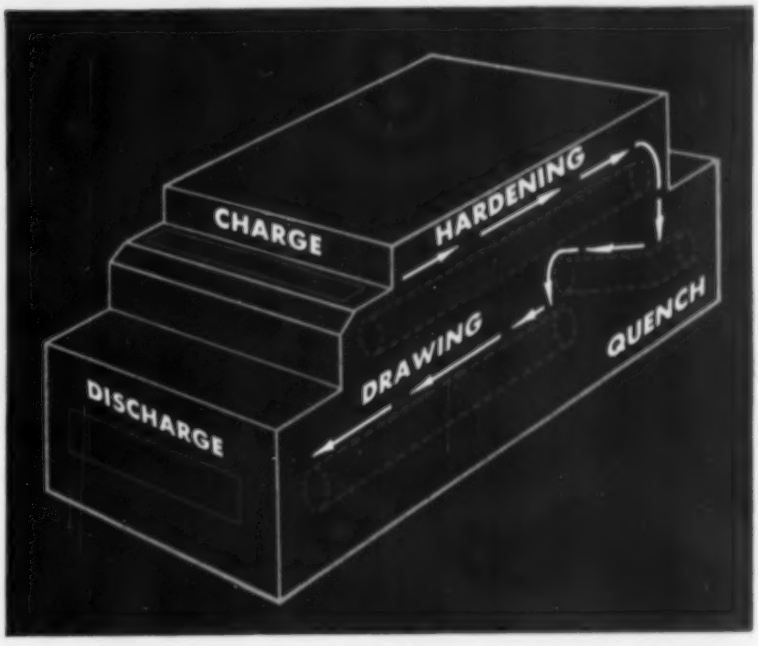
July 25-28, National Tool & Die Manufacturers Association: Summer meeting, Stanley hotel, Estes Park, Colo. Association's address: 907 Public Square Bldg., Cleveland 13, O. Executive secretary: George S. Eaton.

Aug. 6-8, Society of Automotive Engineers Inc.: National west coast meeting, Mark Hopkins hotel, San Francisco. Society's address: 29 W. 39th St., New York 18, N. Y. Secretary: John A. C. Warner.

Aug. 21-24, Western Electronic Show and Convention: Pan Pacific Auditorium and Ambassador hotel. Information: WESCON, 344 N. LaBrea Ave., Los Angeles 36, Calif.

Sept. 7-9, Metal Powder Association: Fall meeting, Homestead, Hot Springs, Va. Association's address: 420 Lexington Ave., New York 17, N. Y. Secretary: Robert L. Ziegfeld.

BLAZING THE HEAT TREAT TRAIL WITH HOLCROFT



LET'S TALK ABOUT
DOUBLE DECK FURNACES

Ever try to fit two entirely different furnaces into floor space where only one will go? It can be done. All you do is *stack one on top of the other!*

Holcroft did it first a good many years ago. The furnace illustrated—by no means the first of its type—was built for a Detroit automobile plant back in 1932.

Three thousand pounds of connecting rods and spindles each hour were treated—moving first through a hardening furnace on the upper deck and then down a chute into a quench tank. Work was elevated by means of a reverse conveyor from the tank and loaded onto the return conveyor belt of the lower furnace for drawing and discharge.

Furnaces like these can be fully automated, or have manual transfers. They can be designed to heat treat a specific part, or to be used for general production.

This is the kind of heat treat background and creative engineering that is available to you when you come to Holcroft. It's a good idea to do it—*today!*

HOLCROFT AND COMPANY
6545 EPWORTH BOULEVARD • DETROIT 10, MICHIGAN
PRODUCTION HEAT TREAT FURNACES FOR EVERY PURPOSE
CHICAGO, ILL. • CLEVELAND, OHIO • DARIEN, CONN. • HOUSTON, TEXAS • LOS ANGELES, CALIF. • PHILADELPHIA, PA.
CANADA: Walker Metal Products, Ltd., Windsor, Ontario

B9 RESINOID CUT-OFF WHEEL

The B9 is an ideal high production wheel, adaptable to speeds up to 16,000 sfpm. Available with either smooth sides, or with the rougher "F" sides for greater chip clearance. An exceptional performer on both ferrous and non-ferrous metals. For dry cutting only.

R50 RUBBER CUT-OFF WHEEL

Designed primarily for wet-cutting metal bar stock, the Norton R50 rubber bonded wheel handles diameters up to 6". Built-in chip clearance — unusual in this type of wheel — is an advantage for freer, cooler cutting, with minimum burr and without case hardening the work. Can also be used for dry cutting.

Three for thrift!

Norton cut-off wheels . . .
fast, safe and long-lasting . . .
bring you the profit-boosting
"TOUCH of GOLD"

Norton has brought cut-off wheel development to the point where you can be sure of fast, clean cutting action, low rate of wear and a wide safety margin on every job.

That goes for all metals, from softest to hardest — for non-metals ranging from rubber hose to marble — and for any type of machine, high speed or low speed, swing frame, chopper, traverse, floor stand or portable.

Three of the most popular Norton cut-off wheels are shown here. See your Norton Distributor for practical help in wheel selection and facts on dry vs. wet methods for your cutting-off operations. Or write to the nearest District Office of NORTON COMPANY, Worcester 6, Mass. Distributors in all industrial areas, listed under "Grinding Wheels" in your phone book, yellow pages. Behr-Manning Company, Troy, N. Y., division of Norton Company. *Export:* Norton Behr-Manning Overseas Incorporated, Worcester 6, Mass.

W-1702

NORTON
ABRASIVES
Making better products...
to make your products better

NORTON PRODUCTS: Abrasives • Grinding Wheels
Grinding Machines • Refractories
BEHR-MANNING PRODUCTS: Coated Abrasives
Sharpening Stones • Behr-Cut Tapes

BN RESINOID CUT-OFF WHEEL

Extra strength and safety, plus knurled sides for more effective cutting action, make the reinforced, resinoid bonded BN wheel a great favorite for the widest range of jobs, especially non-ferrous operations. Other uses include: cutting wire rope; slotting railway track welds; tuck pointing; cutting fibre board, concrete, tile, plastics, and the like.

Veteran Chief takes post-graduate training at Ansul fire school...you can too

Throughout his entire career, Floyd Dumas has practiced what he preached . . . *you can't have too much fire training.* So it was logical that this veteran of 29 years' experience should attend Ansul's Fire Training School. As Chief of Fire Prevention for Parke Davis & Co., one of the nation's leading manufacturers of pharmaceuticals, his responsibilities are tremendous. The information Floyd took home from the Ansul School was passed on to each member of his staff who will be better firefighters for it.

You too can have this training. Ansul is the nation's pioneer in the field of fire training, and the only manufacturer to offer this important service to its customers. It is just one of many "extra" services made available to all Ansul users. And there is no charge whatsoever. Since 1940 this unique school has graduated over 2,800 students from all over this hemisphere, parts of Europe, Asia, and the Middle East.

Training at the Ansul Fire School is of the practical kind. The classroom is Ansul's five-acre test field containing all the latest equipment, and staffed by expert instructors. You owe it to your business, to your position, to learn more about the Ansul Fire Training School.

Get in touch with your local ANSUL MAN through the yellow pages of your phone directory, or write to THE ANSUL CHEMICAL COMPANY, DEPT. S - 6, MARINETTE, WISCONSIN.

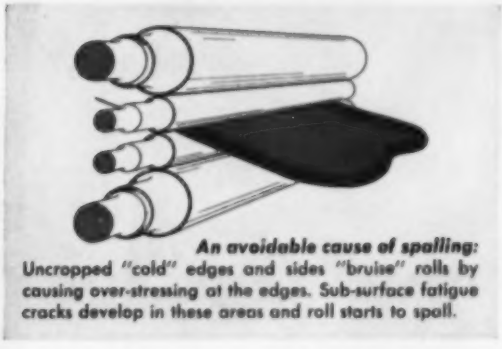
ANSUL

TIPS FROM A ROLL MAKER'S NOTEBOOK

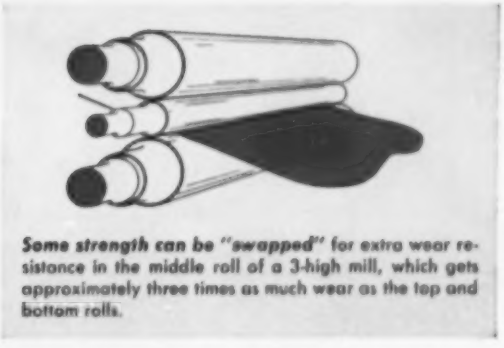
MACKINTOSH-HEMPHILL DIVISION, E. W. BLISS COMPANY, Pittsburgh 3, Pennsylvania

Cast mill rolls • Johnston cinder pots • rotary tube straighteners • end-thrust bearings • heavy-duty lathes • steel and special alloy castings

How to get longer life from plate mill work rolls



An avoidable cause of spalling: **Uncropped "cold" edges and sides "bruise" rolls by causing over-stressing at the edges. Sub-surface fatigue cracks develop in these areas and roll starts to spall.**

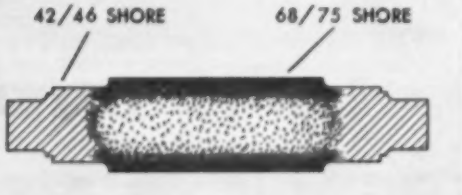


Some strength can be "swapped" **for extra wear resistance in the middle roll of a 3-high mill, which gets approximately three times as much wear as the top and bottom rolls.**

In plate mill work rolls, the balance of strength-vs.-hardness varies with the type of mill, the stand, and the rolling stresses involved. In general, however, the harder the rolls, the better.

This is particularly true of the work rolls in a 4-high mill and of the middle roll in a 3-high mill when used for finishing passes. On the other hand, the absence of grinding facilities in some plants often puts a limit on hardness, since the rolls must be soft enough to machine.

Spalling and fire cracking – With the many suitable combinations of mechanical properties available today, the life expectancy of a cast iron plate mill work roll depends largely on its resistance to fire cracking and spalling. And the current demand for good plate finish has placed even more emphasis on roll surface condition.



Triple-poured Nironite "F" roll, **showing hardness ranges for the roll surface and the neck.**

Three kinds of iron in a single roll – Mack-Hemp metallurgists have answered all these requirements in the *Nironite "F"* roll, a high-alloy grain-type roll.

Nironite "F" rolls are always double-poured, and sometimes even triple-poured. The deep outer shell is nickel-chromium alloy iron—very hard, very dense, and highly resistant to fire cracking. The second metal, a soft gray iron, provides the strength and resistance to impact needed in the core. Finally, the necks of all large Mack-Hemp plate mill rolls are cast with a third alloy whose carbon content is closely controlled. This third pour eliminates the tendency to weakness and coarse grain structure often encountered in the necks of double-poured plate mill rolls (a result of the slow cooling rate of the large mass of metal in the necks). It provides increased strength and a fine grain structure that prolongs the life of the roll neck bearings.

Another Nironite grade—*Nironite A*—is also widely used for work rolls in many plate mills. A single-poured cast iron grain roll of slightly lower alloy content than the iron of the first pour in Nironite "F" rolls, it provides excellent strength properties at somewhat lower hardness levels.

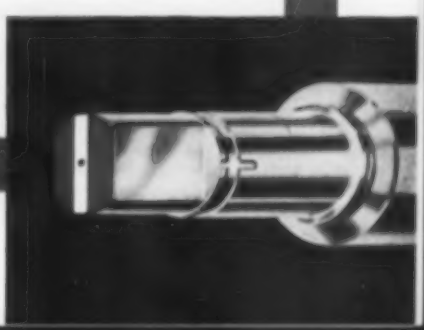
No matter what type of rolling you do . . . ferrous or non-ferrous . . . Mack-Hemp roll engineers and metallurgists can help you with your special problem. Simply write Mackintosh-Hemphill Division, E. W. Bliss Company, 901 Bingham Street, Pittsburgh 3, Pa.

MACKINTOSH-HEMPHILL

You get more tonnage from the rolls with the Striped Red Wabblers

Division of E. W. BLISS COMPANY

Presses, Rolling Mills, Special Machinery



REPEAT ORDERS

...the true measure of Customer Satisfaction

A NORRIS-THERMADOR PRESS LINE shows bathtubs being drawn in a single operation on the versatile 6000 ton Lake Erie press at the left. The tubs move down the line where they are trimmed on a 1500 ton Lake Erie and flanged on a 3000 ton Lake Erie. Norris-Thermador Corporation serves many segments of the consumer, industrial and military markets with products from eight manufacturing plants.

NORRIS-THERMADOR CORPORATION

has re-ordered Lake Erie Presses nearly **40 TIMES**

Ask about 16mm, sound, color film "Pressure on Metalworking Production".

LAKE ERIE
ENGINEERING CORP.
BUFFALO, N.Y. U.S.A.

No endorsement for a product is more convincing than a repeat order . . . unless it is dozens of repeat orders! Norris-Thermador purchased its first "Lake Erie" in 1940 and has since run the total to more than 80 presses. In a recent letter, Mr. Kenneth T. Norris, President of Norris-Thermador Corporation, said: "It has now been fifteen years since we installed our first Lake Erie hydraulic press and it is still operating day in and day out in an entirely satisfactory manner."

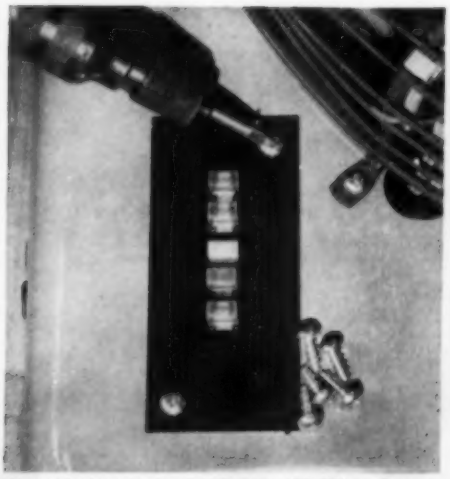
LAKE ERIE ENGINEERING CORP.

General Offices and Plant: **882** *Woodward Ave., Buffalo 17, N.Y.*
District Offices in New York, Chicago, Detroit, Pittsburgh
Representatives in other U. S. Cities and Foreign Countries

LAKE ERIE® ● **Manufacturers of die casting machines and the most complete line of hydraulic presses for all industry.**

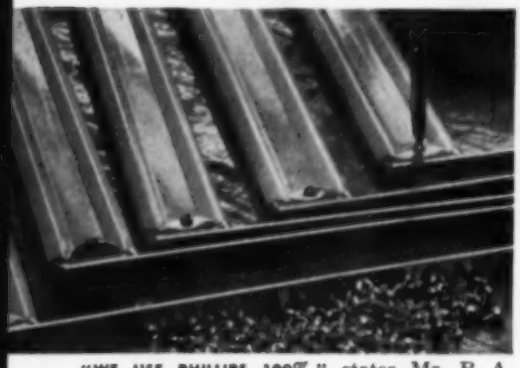
Three Users Give Many Reasons For Using

PHILLIPS CROSS RECESSED HEAD SCREWS



SAMSONITE LUGGAGE uses Phillips Cross-Recessed-Head Screws to hold the alabaster plastic garment bar to metal hanger. "Not only are recessed head screws required in all our specification sheets, but Phillips is the one type specified throughout," says Mr. W. G. Axtell, Chief Engineer of Shwayder Brothers.

"WE USE MORE THAN 1,000,000 Phillips screws annually," says Mr. R. M. Shoemaker, liaison engineer for Portable Electric Tools, Inc., "they reduce danger of damage to finished parts, affect a tighter bond, upgrade production and enhance the appearance of our end product."



"WE USE PHILLIPS 100%." states Mr. R. A. Burket, Production Manager of McGraw Electric Co., Lonergan Manufacturing Division, "because experience has taught us that they are the fastest assembled in high-speed production line, hold their bond indefinitely under conditions involving constant vibration, and make a more decorative finished product."

MANUFACTURERS OF PHILLIPS CROSS-RECESSED-HEAD SCREWS

THE FASTENERS OF TODAY...
AND OF THE FUTURE
X marks the spot
the mark of extra quality

Pledged to highest standards...

The Phillips Screw manufacturers listed here cooperate to turn out a uniformly high standard of quality. As sponsors of the Phillips Cross-Recessed-Head Standards Committee they adhere to the established dimensional standards, gauges, and gauging methods which will best serve industry.

Members of Screw Research Association

American Screw Company • Atlantic Screw Works, Inc. • The Blake & Johnson Co. • Central Screw Company • Continental Screw Co. Elco Tool and Screw Corporation • Great Lakes Screw Corp. • The H. M. Harper Company • The Lamson & Sessions Company • National Lock Company • The National Screw & Manufacturing Company • Parker-Kalon Division, General American Transportation Corporation Pheoll Manufacturing Co. • Scovill Manufacturing Company • Shakeproof Division Illinois Tool Works • The Southington Hdwe. Mfg. Company • Sterling Bolt Company • Universal Screw Company • Wales-Beech Corporation

In your
MORSE-FRANCHISED DISTRIBUTOR
MORSE COBALT TOOLS

territory and any territory...

the top **ISD**
(the man we deal with exclusively)

is the **MFD**
(your Morse-Franchised Distributor the man with "The Most")

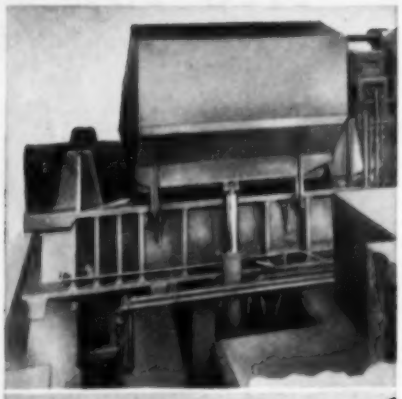
Here's why **MORSE**
means **"THE MOST"**
(World's Most Complete Line of Finest Quality Tests)

MORSE TWIST DRILL & MACHINE CO., NEW BEDFORD, MASS.
(Subsidiary of VAN NORMAN INDUSTRIES, INC.)

Warehouses in New York, Chicago, Detroit, Dallas, San Francisco

Now one man can PUSH-BUTTON-OPERATE one or several Dempster-Balesters!

1



2

3

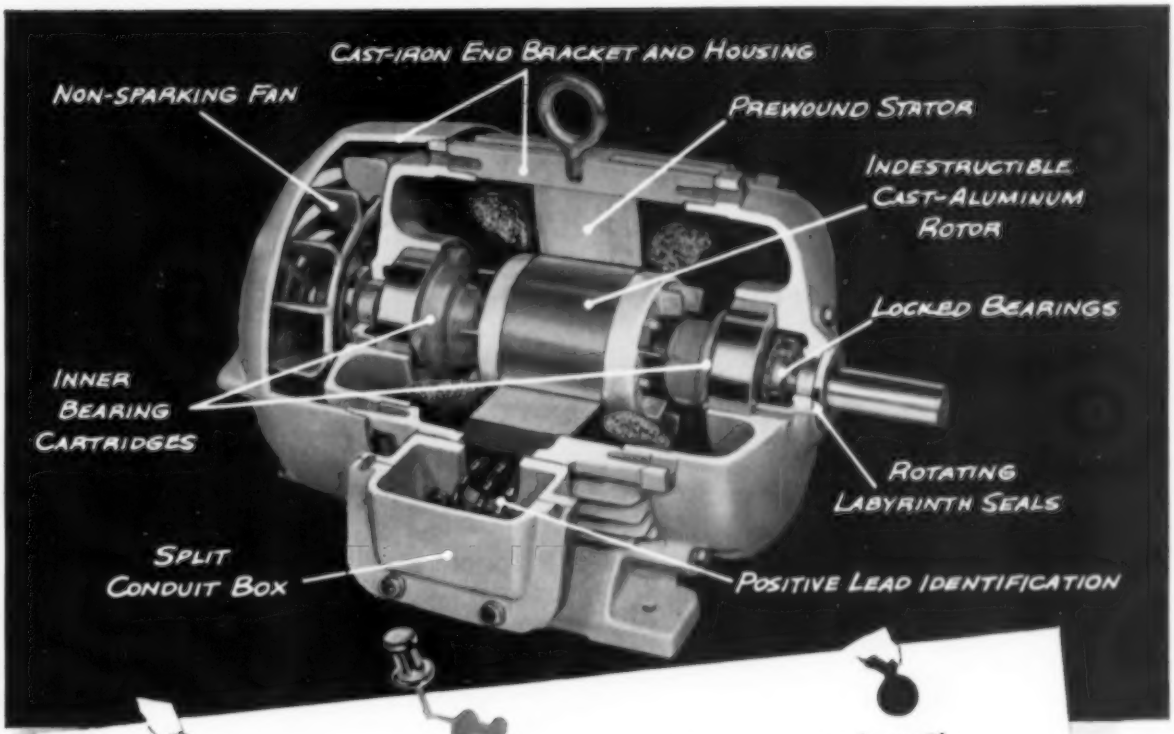
Photo 1 shows push-button controlled Skip Pan loaded. Photo 2 shows it dumping scrap metal into charging box. When Skip Pan returns to be re-loaded, Charging Box Door moves out, pushing last bale forward, clear of charging box (see Photo 3). Bale ejector returns to lowered position. Pusher heads (rams) proceed to bale the scrap and then automatically retract. Charging Box Door opens, bale is ejected and Skip Pan, which has been re-loaded, is ready to dump another load into box for baling.

ONE PRESS may be the Dempster-Balester Model 129. Another the Model 351. Another the Model 701, etc. Each may be the same model, or there may be several of one model, one of another. In addition, one or all may be fully equipped with exclusive Dempster-Balester Auxiliary-Compression Door that enables you to bale in a 1-2-3 continuous cycle. This Auxiliary-Compression Door does not "beat" or "tamp" the scrap. It actually penetrates into the charging box, hydraulically compressing the scrap with a 45-ton force!

Do you need one Dempster-Balester or several? What model? With or without Auxiliary-Compression Door? With or without push-button control panel? Should your press produce one particular size bale, or be equipped to produce different size bales? Isn't it time we got together? Tremendous savings are yours with the right press, properly engineered and equipped to meet your particular requirements. Ask us to give you complete information. *A product of Dempster Brothers, Inc. Sold in Canada by the W. P. Favorite Co., Ltd., 418 Main Street East, Hamilton, Ontario.*

DEMPSTER BALESTER®

DEMPSTER BROTHERS, 666 Dempster Bldg., Knoxville 17, Tennessee



Are you getting all these extras in the motors you buy?

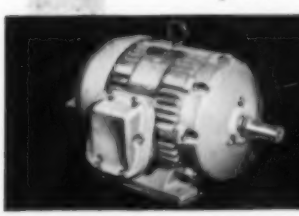
Louis Allis gives them to you in the new L. A. enclosed and explosion-proof motors

For years, Louis Allis has specialized in special motors for many of industry's toughest drive problems. Such installations call for extreme care in both motor design and manufacture—care that has become a habit with us. We build our enclosed and explosion-proof motors with the same special care.

What does this mean to you? It means that you get a motor with extra features—a motor that runs better, lasts longer. Here are a few of the extra reasons why:

- These new motors carry Underwriters' label for use in four groups of hazardous locations—Class I, Group D, and Class II, Groups E, F, and G. This four-group approval for a single motor simplifies your stocking problem.
- New, exclusive phenolic impregnating varnish provides high thermal and chemical resistance. It remains resilient and resists aging, prolonging the life of the motor.
- Inner bearing cartridges lock bearings to end bracket and form explosion-quenching seal along the shaft. Inner race of bearing locked to shaft, reducing end play—an extra quality feature.
- Rotating labyrinth seals keep dirt and moisture out of the bearings—keep grease in.

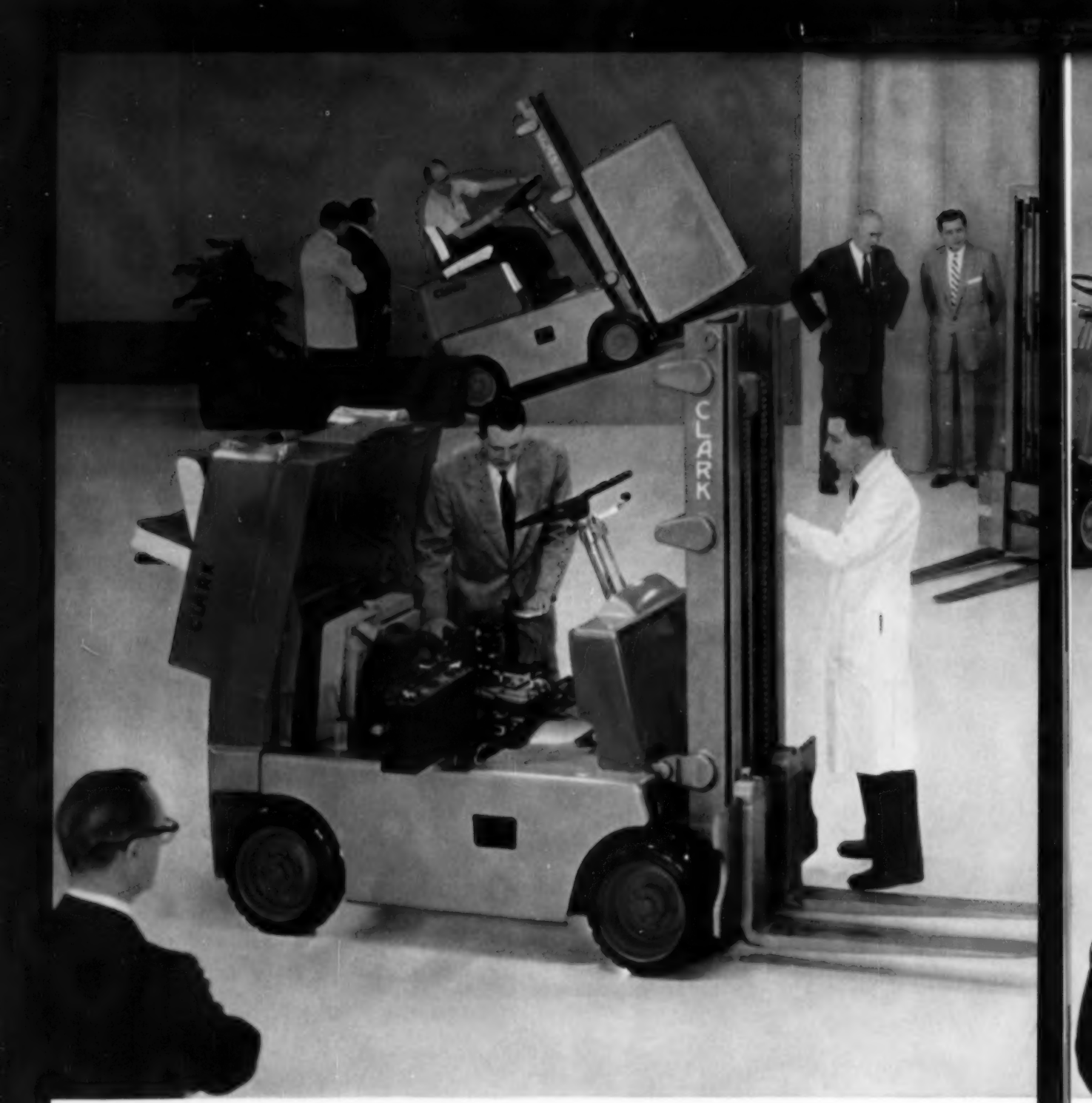
There are many other features such as a new diagonally split conduit box, sturdy cast-iron construction, positive lead identification, non-sparking fan. Our new bulletin No. 1700 shows why you get extra value for your dollar in a Louis Allis explosion-proof motor. Write for your copy.



New LA line explosion-proof motors are available in rerated frame sizes 182 through 326U, and in ratings of 1 to 30 hp, 3 phase, and 1 to 5 hp, single phase. Also available with Underwriters' approval for Class I, Group C hazardous locations.

EP-102

THE LOUIS ALLIS CO.
MILWAUKEE 7, WISCONSIN



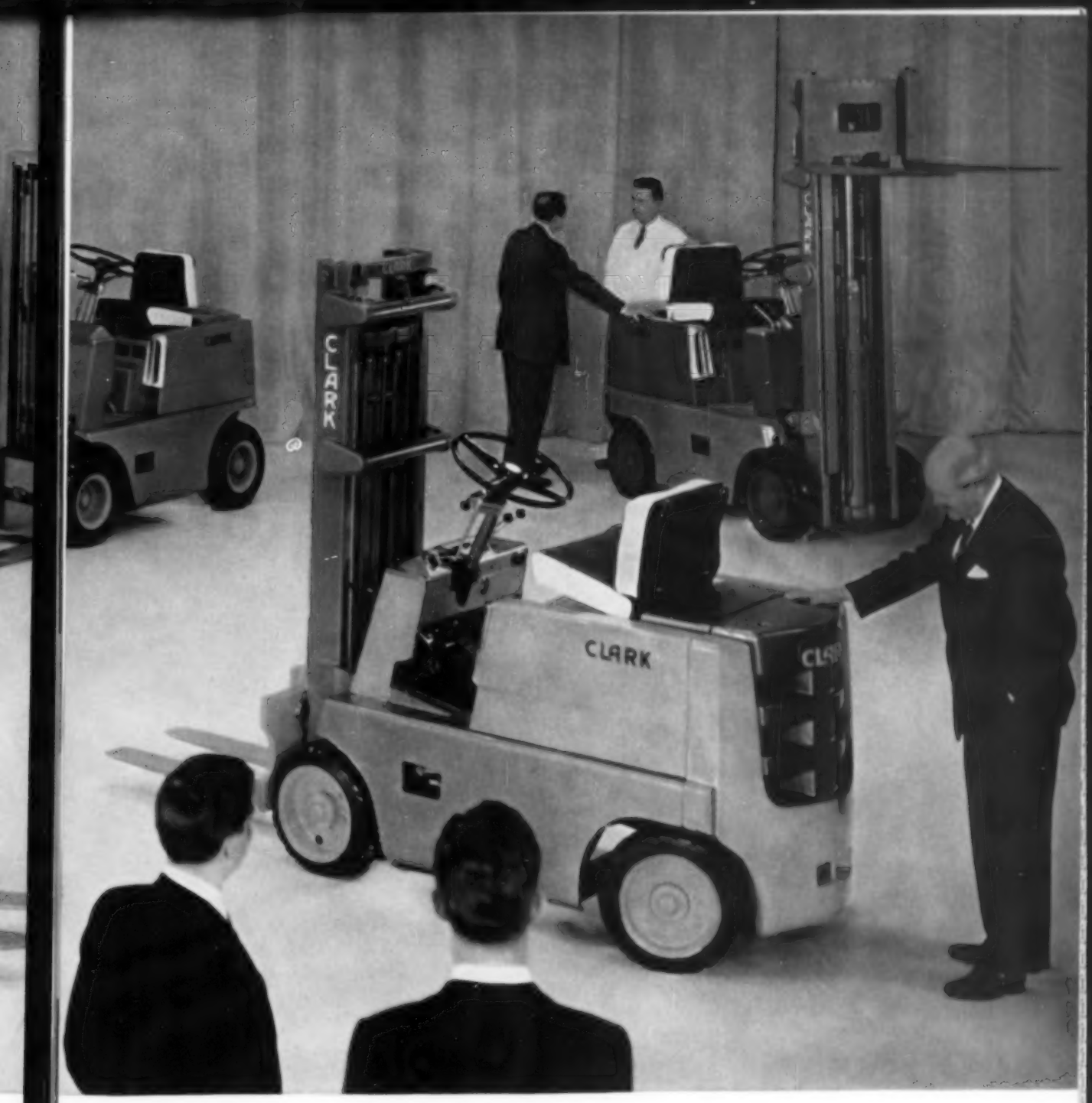
Get a REAL lift—see the all-new

Now, after three years and thousands of engineering and test hours, here is the best design, the most serviceability, the safest and finest performance ever built into one lift truck.

For easy servicing, the *entire* hood folds back. See the miracle of a longer wheel base, same over-all length, tighter turning radius.

Lifting speeds are higher; engine power, tractive effort and gradeability increased, yet control of movement is more precise than ever.

Safety? Comfort? Look at the dead man brake, simplified directional controls, extra-wide adjustable seat, less braking effort, and easy steering.



Clarklift "Leadership Line"

That's just the beginning. This is a completely new truck with dozens of new ideas . . . ideas you wanted in the *ideal* lift truck. Soon your dealer will be able to show them to you in models ranging from two to five thousand pounds capacity. See him . . . you'll get a real lift.

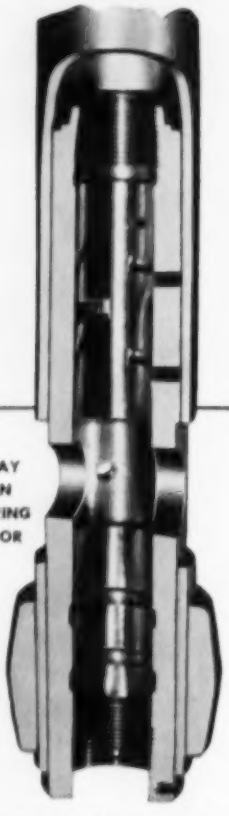
CLARK® EQUIPMENT

Industrial Truck Division
CLARK EQUIPMENT COMPANY
Battle Creek, Michigan

MICROHONING*

with self-dressing abrasives generates consistent *Functional Surface Finishes*

Microhoning, the low-velocity abrading process consistently produces part after part exactly to your specified surface finish requirements, because the abrasive grits always remain sharp.



CUTAWAY SECTION OF STEERING ACTUATOR

Monroe Auto Equipment Co. designed its power steering unit to withstand rugged use while maintaining sensitive control. In the final processing of the hydraulic steering actuator, Monroe chose Microhoning to obtain diametric accuracy, consistent finish and to generate geometric precision.

The rough and finish Microhoning operations removed .005" stock from an interrupted bore 1.125" in diameter and 6⅜" long.

MATERIAL AND HARDNESS: SAE 1118 steel, Rockwell 45-50C

TOLERANCES: size—.0003"
roundness and taper—.0001"

FINISH: 25 microinches or less

CYCLE: rough Microhoning—35 to 40 seconds
finish Microhoning—15 to 20 seconds

MACHINE: Double-column Model 740 Hydrohoner

SELF DRESSING ACTION OF THE ABRASIVES . . . is accomplished by the rotation and reciprocation of the Microhoning tool—the combined motion continuously changes the direction of force on the abrasive grits and keeps them dressed.

EFFICIENT STOCK REMOVAL . . . results from the many sharp-cutting grits acting simultaneously over a wide area of work surface. In this manner, the effect of heat is also minimized. Of all production processes, Microhoning least disturbs the sub-surface structure of the work.

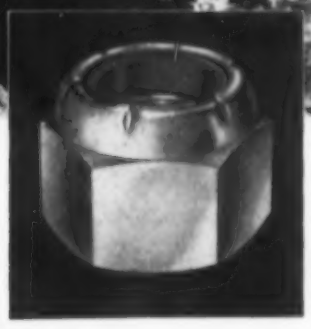
FUNCTIONAL SURFACE CHARACTERISTICS . . . are obtained in one uninterrupted cycle. Microhoning generates accuracy within millionths of an inch . . . surfaces free of waviness, taper, out-of-roundness and structural stresses . . . uniform surface finish and a cross-hatch pattern for best lubrication, sealing and wear characteristics.

For more details on this application write for CROSS-HATCH Vol 8, No 1

*MICROHONING = STOCK REMOVAL + GEOMETRY + SIZE CONTROL + SURFACE FINISH

MICROMATIC HONE CORPORATION

8100 SCHOOLCRAFT AVENUE • DETROIT 38, MICHIGAN



On Link-Belt's new one yard shovel...

ELASTIC STOP® nuts remain tight under terrific shock loads

The engineering concept behind Link-Belt's new LS-98 Shovel-Crane provides a highly portable machine with big shovel characteristics plus stepped-up work cycles that produce substantial increases in capacity. To do this, the shovel-crane had to be built to stand up under heavy vibration and extreme shock loads. That's why Elastic Stop nuts were chosen for the critical fastening jobs throughout (i.e., hook rollers to brackets, clutch drums to gears, counterweight to upper frame, drum laggings to brake drums, engine mountings, side housing to revolving frame, etc.).

Elastic Stop nuts secure clutch drums to gears.

The locking principle of Elastic Stop nuts has been tested and proved by over 25 years of actual field service on equipment like this in every conceivable product of industry from locomotives to roller skates. What's special about this nut? For one thing, you can "stop" it at any position on the threaded length of the bolt . . . or wrench it tight against the work. No matter where you leave it on the bolt, it will remain tight in that exact position, even though you subject it to heavy vibration and shock loads. Reusable many times.

Elastic Stop nuts are available from a watchmaker's 0-80 all the way to 4"—in stainless steel, brass, aluminum and other alloys. Protect *your* product with "fastener insurance." We'll supply free test samples.

ESNA

ELASTIC STOP NUT CORPORATION OF AMERICA

2330 Vauxhall Road, Union, N. J.

Elastic Stop Nut Corporation of America
Dept. N7-660, 2330 Vauxhall Road, Union, N. J.

Please send me the following free fastener information:

☐ ELASTIC STOP nut bulletin

☐ Here is a drawing of our product. What self-locking fastener would you suggest?

Name _____ Title _____

Firm _____

Street _____

City _____ Zone _____ State _____

Here's how you can help make stainless plate stocks go a LONG way...

Whenever demand outdistances supply you have problems. But any problem can be solved when all hands cooperate. If you keep in mind these "rules of the road" you will be able to add extra mileage to the supply . . .

1. If you have a D.O. rating, give it to your supplier—it helps him get the necessary nickel, and protects your position on his schedule.
2. If you are going to cut plate into smaller pieces, give your supplier the option of furnishing small pieces.
3. Plan ahead as much as possible, so your supplier has a reasonable chance to meet your delivery requirements.
4. If an alternate analysis or a slight variation in gage is acceptable, let your supplier know.
5. Buy "cut-to-shape" pieces and reduce your time and costs of handling scrap.
6. Clean out your stainless scrap so that it can get back into production.
7. Order only what you need in stainless plate—to exact size.

Put these simple rules to work . . . it will help you, and all of us, stretch the supply to the limit.

Stainless Steels Exclusively

G. O. CARLSON, INC.

Plate • Plate Products • Forgings • Bars • Sheets (No. 1 Finish)

THORNDALE, PENNSYLVANIA

District Sales Offices in Principal Cities

.....at

ILLINOIS GEAR

Quality always comes first

***Quality** that you can trust characterizes every step of the manufacture of ILLINOIS GEARS.*

Skilled craftsmen equipped with the world's finest and most modern tools, plus precision inspection and quality control, with extremely careful attention to materials, heat treatment and tolerances, all combine to produce the finest gears in America.

You want gears that are made right, *with quality as the first consideration*—depend on ILLINOIS GEARS.

Look for this mark ILL® *the symbol on finer gears*

ILLINOIS GEARS

Gears for Every Purpose ... one gear or 10,000 or more

ILLINOIS GEAR & MACHINE COMPANY

2108 NORTH NATCHEZ AVENUE • CHICAGO 35, ILLINOIS

FELLOWS EQUIPMENT FOR FINE-PITCH GEARS

cuts production time up to 50% at *ALLING-LANDER!*

1. Gears for a major instrument maker: Fellows 3" Fine-Pitch Gear Shaper turns them out at one-third previous cost, more than twice as fast: 120 finished gears per hour, compared to old rate of 55.

2. For extra precision: Fellows No. 4 Fine-Pitch Gear Shaving Machine makes good gears better with finer finish, minimum backlash, tighter tolerances where desired.

3. Proof: Fellows No. 4 Fine-Pitch Red Liner Inspection Instrument makes a permanent, graphic record of gear quality . . . quick, efficient and accurate.

Well known for their excellent service in producing instrument type gears of close tolerance, the Alling-Lander Company, Inc. of Sodus, New York has cut gear production time up to 50%, and unit costs more than half, by using the latest Fellows equipment in their fine-pitch gear department.

Fellows Precision Line also includes other types of gear inspection instruments and a number of models of Gear Shapers for cutting spur and helical gears of larger sizes. Your Fellows representative can give you information about any of them. Write, wire or phone any of our offices.

THE FELLOWS GEAR SHAPER COMPANY
78 River Street, Springfield, Vermont
Branch Offices: 319 Fisher Building, Detroit 2
5835 West North Avenue, Chicago 39
2206 Empire State Building, New York 1
6214 West Manchester Avenue, Los Angeles 45

THE PRECISION LINE *Fellows* *Gear Production Equipment*

SIDES, ENDS, AND DOORS of these hoppers are made from USS "T-1" Steel plate (¼" thick in sides and ends; ⅜" thick for doors). "T-1" was sheared, punched, and welded without difficulty.

60 ORE CARS FOR INTERNATIONAL NICKEL CO. BUILT WITH USS "T-1" STEEL

Unique 3-way superiority of "T-1" Steel dictated choice

Copper and nickel ores are extremely hard and abrasive. Nevertheless, ore cars must last a long time. They must withstand severe corrosion, tremendous impact and abuse, day after day, for years. In the cold belt of northern Ontario, they must stay tough and durable, be able to take tremendous abuse, even at sub-zero temperatures.

The one steel that fills *all* these requirements, at the lowest cost for top performance, is USS "T-1" Steel. So International Nickel Company of Canada specified USS "T-1" for 60 new ore cars, built by Canadian Car and Foundry Company, Limited, for use in the largest nickel mining operations in the world, in the Sudbury District, Ontario.

In these cars, USS "T-1" Steel, which has a yield strength of 90,000 psi, plus amazing ability to withstand impact at low temperatures, is expected to increase service life substantially over cars made of carbon steel. Its far greater strength and toughness and ability to withstand abrasion should materially reduce maintenance and the need for part replacement. Result: more continuous operation and lower costs.

WHERE CAN YOU USE USS "T-1"?

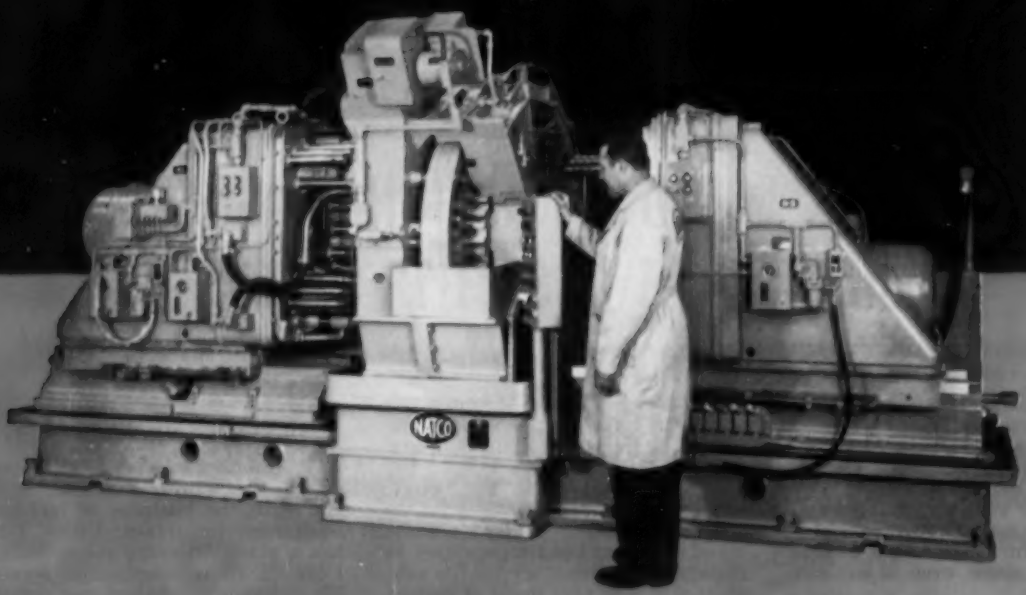
Look around *your* operation. If you are in the mining business, or if you're in the business of building equipment for mines, USS "T-1" has a place. In many mines today, USS "T-1" is lengthening service life, reducing weight and cost, simplifying fabrication, increasing capacity of rugged mining equipment. It can do the same for you. Write for details. Or wire, or phone. United States Steel, Room 5339, Pittsburgh 30, Pa.

UNITED STATES STEEL CORPORATION, PITTSBURGH · COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO
TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA. · UNITED STATES STEEL SUPPLY DIVISION, WAREHOUSE DISTRIBUTORS, COAST TO COAST
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

USS "T-1" CONSTRUCTIONAL ALLOY STEEL

UNITED STATES STEEL

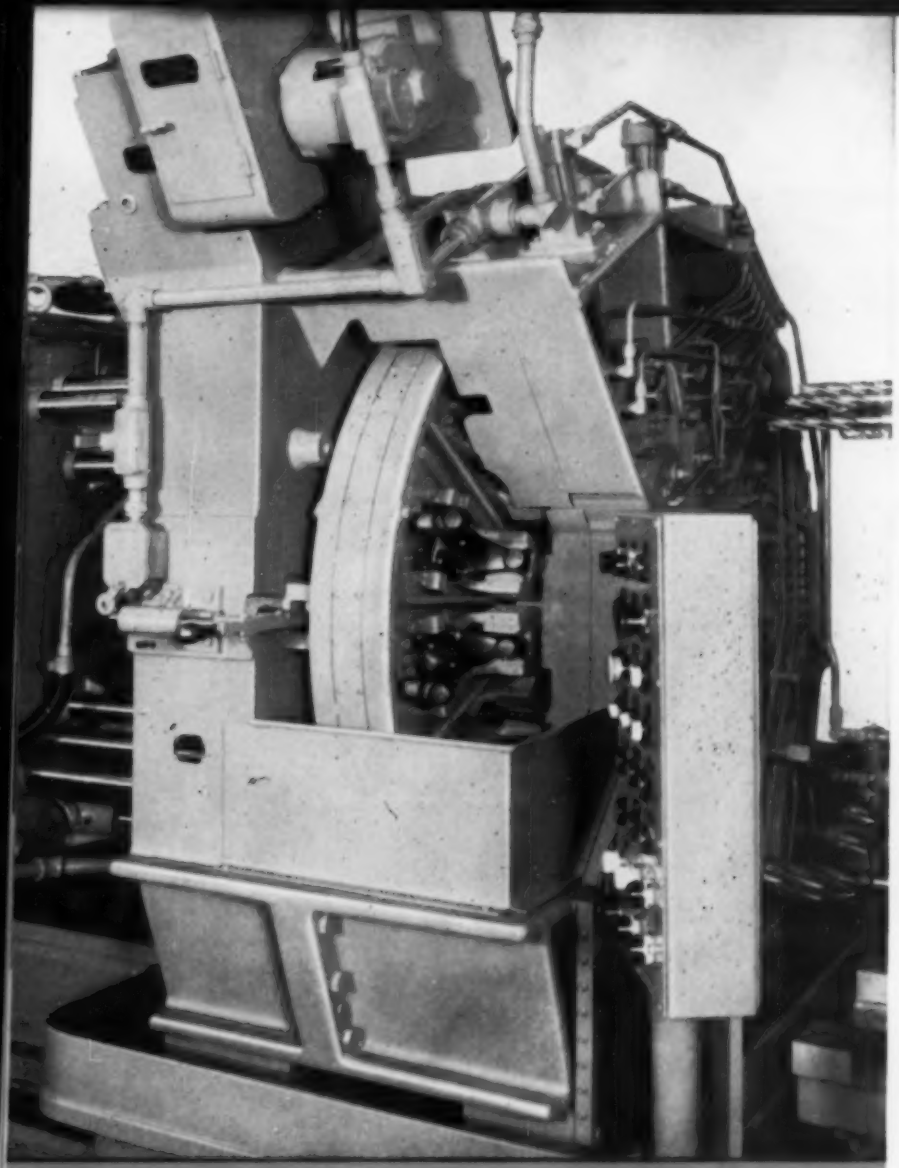
New Natco® Performs 17 Operations Every 15 Seconds



Performance—this Natco 2-way horizontal drilling machine produces 260 steering knuckles per hour. Holds limits as close as .004". Parts are clamped automatically in the interlocked trunnion fixture—spot-drilled, drilled, spotfaced, reamed and counterbored.

Features—Automatic time delay reverse, positive stop, coolant system with magnetic chip separator, automatic lubrication to heads and ways, hydraulic feed and J. I. C. compliance. Let a Natco field engineer help you with your drilling, boring, facing and tapping problems.

Ask for information about the PAYD (Pay-As-You-Depreciate) finance plan.



Notes from Natco...

Whole Hog or Piecemeal

Seems like two distinct approaches are being taken in the adoption of automatic assembly methods. The "whole hog" school favors abrupt change . . . wait until you can install a machine that will handle the *complete* assembly job. The "piecemeal" school favors a step-by-step transition, starting with the basic transfer mechanism and adding automatic stations one or two at a time.

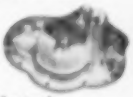
Variety Show

The critics say you can't have high production and versatility, too. But one of our eastern customers has run his drilling show that way for years. On seven adjustable multi-spindle Natcos, he drills and taps over 1000 different parts in lots from 50 to 10,000.

Shuttle for Speed

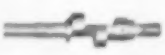
Like the Three Musketeers, drilling, chamfering and tapping go together. Natco is now building sliding tables for their small standard machines allowing all three operations with one push of the button. Starting in drilling position, table automatically indexes for chamfering and tapping; then returns. Up to 24 operations at a crack.

Processed by Natco Machines



Part: Gear Housing
Machine: Natco vertical Holesteel
Operations: Drill 11 holes; Counterbore 1 hole; Chamfer 3 holes; End cut ream 1 hole; Combination ream, face and chamfer 1 hole; Ream 3 holes.
Production: 90 per hour

Part: Cylinder Block
Machine: Natco Holesteel
Operations: Drill 17 holes in 4-cylinder block or 23 holes in 6-cylinder block.
Production: 40 parts per hour



Part: Shaft
Machine: Natco H-5
Operations: Combination drill and chamfer 3 holes; Drill 4 holes.
Production: 80 parts per hour

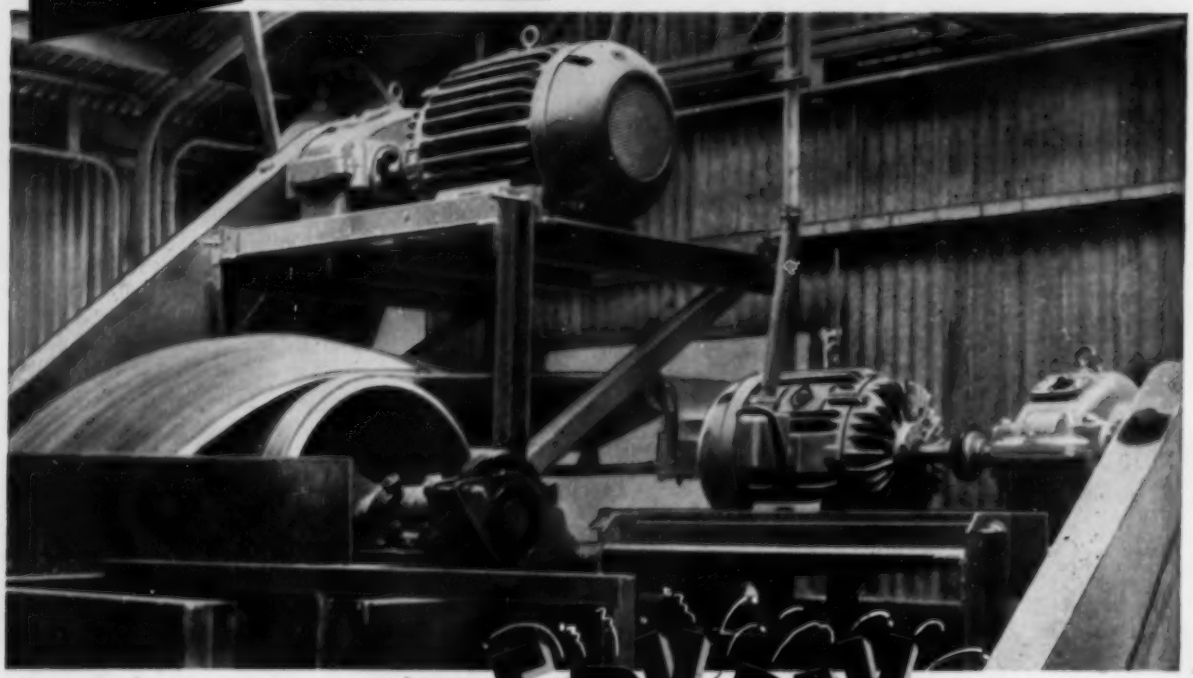
NATIONAL AUTOMATIC TOOL COMPANY, INC.
Richmond, Indiana

Multiple-spindle drilling, boring, facing and tapping machines
Special machines for automatic production

NATCO

Call Natco offices in Chicago, Detroit, Buffalo, New York, Boston, Philadelphia, Cleveland and Los Angeles; distributors in other cities.

There's **MORE** Cooling Surface in these deep-ribbed **MOTORS**



No Day is FRYDAY

with these Allis-Chalmers MOTORS

● Frying of insulation is impossible under normal conditions with the extra-large cooling surface of Allis-Chalmers rib-type TEFC motors. The result—you expect and get longer motor life.

Get Complete Information

As a new machinery component or as replacement, specify Allis-Chalmers. Discuss your particular application with your nearby A-C distributor, A-C district office, or write Allis-Chalmers, General Products Division, Milwaukee 1, Wisconsin.

The engineered partner of A-C motors is Allis-Chalmers control.

ALLIS-CHALMERS

A-4920

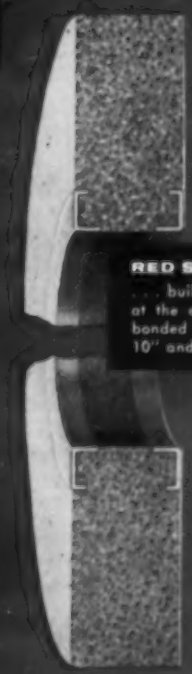
SIMONDS ABRASIVE CO.

GRINDING WHEELS... with *improved bushings* for better grinding

TRUFIT
. . . a resin-impregnated fiber sleeve in the center hole, principally for resinoid bonded wheels for portable grinders.

POLYSTYRENE
. . . injection molded plastic material replacing conventional lead bushing, chiefly for tool room wheels such as 7 x ½ x 1¼.

STEEL INSERTS
. . . threaded or plain, in sizes to fit all portable grinders, including straight wheels, cup wheels and cones.



RED STREAK FLANGES
. . . built-in circular steel flanges at the center hole. For resinoid bonded snagging wheels with 6", 10" and 12" hole sizes.

KARVIT
. . . a hard, non-metallic material with a smooth surface, replaces lead or plain holes, principally for precision grinding wheels.

Better, more economical grinding! Simonds literally "centers" on this with these improved bushings. For you, this means better grinding efficiency . . . in terms of better spindle fit, better balance, truer running, less wear on spindles and center mounts and better work produced.

Put all these advantages to work for you by specifying Simonds Abrasive Co. Wheels on all your grinding jobs.

SIMONDS ABRASIVE COMPANY • PHILADELPHIA 37, PA.

Branch Warehouses: Boston, Detroit, Chicago, Portland, San Francisco. Distributors in Principal Cities

Division of Simonds Saw and Steel Co., Fitchburg, Mass.

Here's a drum that can't be beat!

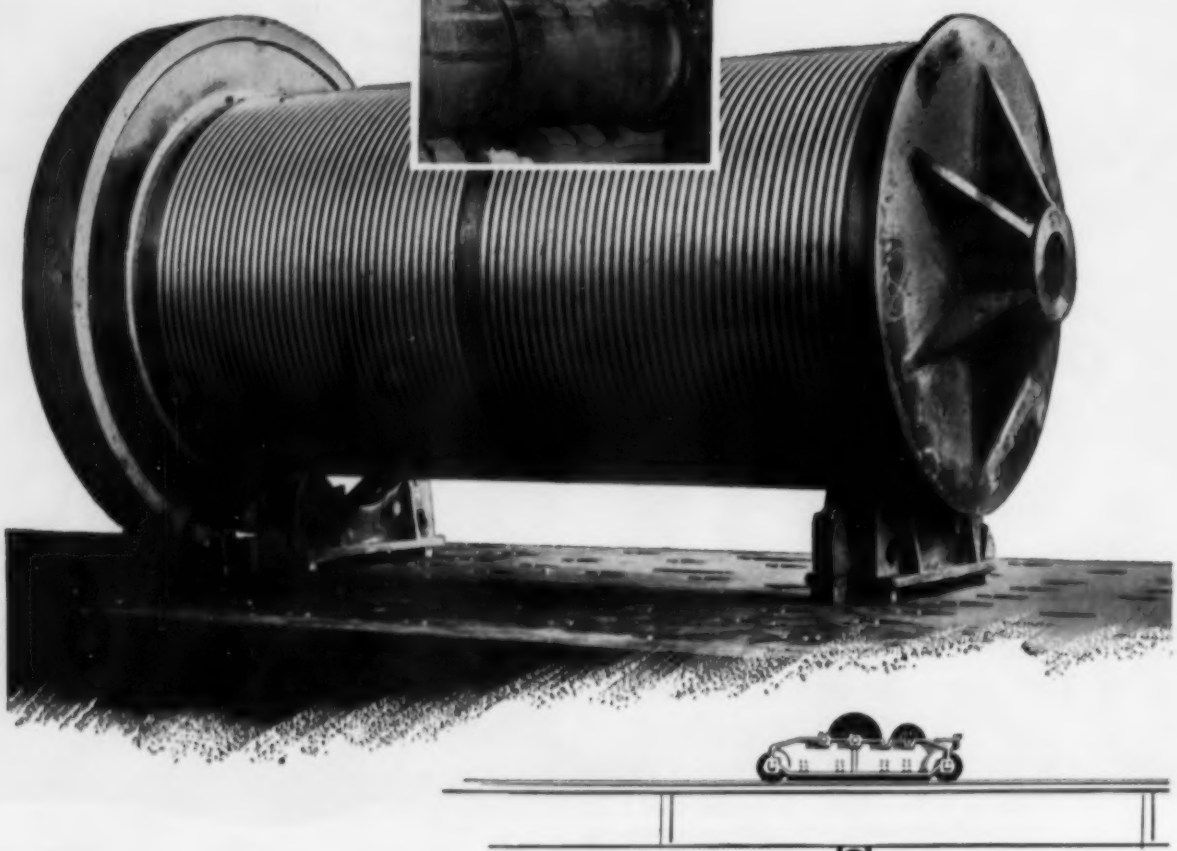
• *Fabricated drums* in Morgan cranes are structurally stronger than cast drums . . . yet they weigh less.

Automatic welding of Morgan drums with the world's largest continuous welding machine assures uniform, sound joints and seams.

Crane girders, too, are welded automatically, making them stronger and lighter. Morgan welders are qualified in accordance with A.S.M.E. and A.W.S. codes.

Performance records prove conclusively that Morgan cranes are the best in the business . . . cost less to operate and maintain. Let our representative show you how to save the most by buying the best . . . Morgan!

Automatic welding speeds up to 120" per minute are achieved on Morgan's continuous welder. Perfect welding penetration assures uniform, strong welds.



The Morgan Engineering Company, founded in 1868, manufactures overhead electric traveling cranes, gantry cranes, open hearth special cranes, plate mills, blooming mills, structural mills, shears, saws, and auxiliary equipment.

THE MORGAN ENGINEERING CO. *Alliance, Ohio*

The gears in an automatic nut former have to be tough and strong to withstand heavy, varying loads. Yet, the castings from which they're made should be easy to machine. That's why this gear for a Waterbury Farrel Automatic Nut Former is made from ASTM-50 gray iron with a nominal composition of 1% nickel and .50% molybdenum.

Moly gives cast iron gears higher strength with toughness and good machinability

"To insure a tough, easily machined gray iron for the gears in our Automatic Nut Formers," says Henry C. Griggs, Metallurgist for Waterbury Farrel Foundry & Machine Co., "we specify .50% molybdenum in our ASTM-50 material. The properties of this material contribute importantly to the reputation of Waterbury equipment for accuracy and high speed production under severe operating conditions."

Molybdenum helps to give reliable and reproducible castings – very important factors in consistent performance of gears.

Investigate moly irons. They may be the key to better performance in many of your gear applications.

For the first two in a series of bulletins, "Why Moly Iron," or for technical assistance, write Climax Molybdenum Co., Department 3, New York 36, N. Y.

CLIMAX MOLYBDENUM

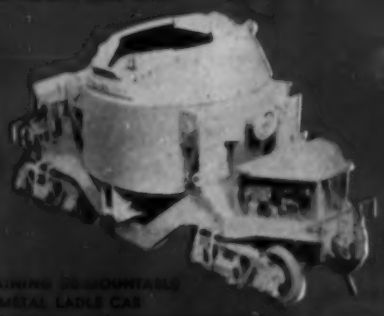
Pollock Experience at No Extra Cost

The William B. Pollock Company has been serving the iron and steel industry the world over since 1863.

Pioneers in heavy steel work, Pollock is excellently qualified, equipped and staffed to design and build your special heavy-duty equipment.

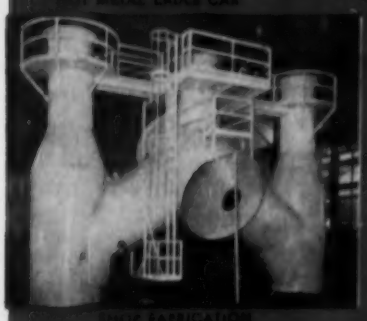
Pollock is known for its reliable, efficient precision work. You, too, can benefit from Pollock's broad experience.

BLAST FURNACE CINDER CAR AND OPEN HEARTH SLAG CAR



HEAT RETAINING DE-MOUNTABLE HOT METAL LADLE CAR

PICTURED ABOVE IS POLLOCK FIELD ERECTION EQUIPMENT IN THE PROCESS OF ERECTING A MODERN BLAST FURNACE



SHOP FABRICATION

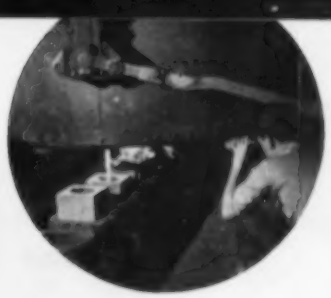
WELDED OPEN HEARTH LADLE

FIELD ERECTION

POLLOCK
SINCE 1863

THE WILLIAM B. POLLOCK COMPANY
YOUNGSTOWN · OHIO
STEEL PLATE CONSTRUCTION · ENGINEERS · FABRICATORS · ERECTORS

BLAST FURNACES · HOT METAL CARS AND LADLES · CINDER AND SLAG CARS · INGOT MOLD CARS · CHARGING BOX CARS · WELDED OPEN HEARTH LADLES



How Men and Controls Protect Industry's Confidence in *Carpenter* High Speed Steels

The *performance* you get from high speed steels is directly related to *how* they are produced. As a specialty mill where quality overshadows tonnage . . . and all operations are set to this standard . . . Carpenter devotes the time and attention required to produce high speed steels of the finest quality.

From careful scrap purchasing to guaranteed analysis, and painstaking time and temperature checks during melting . . . through rigid controls of bar reduction in rolling, and many other quality tests at all steps . . . these are the "indispensables" that have enabled Carpenter to produce the finest High Speed Steels for 60 years. And most important is the *personal attention* Carpenter men give to every order. The experience, pride and skill these craftsmen put into the production of every bar make Carpenter High Speed Steels your most dependable investment. Your best proof is to place your next order with Carpenter . . . and see what a difference there *can* be in High Speed Steels. THE CARPENTER STEEL COMPANY, 139 W. Bern St., Reading, Penna.

Every Order of *Carpenter* High Speed Steels Undergoes These and Many Other Quality Controls

- All scrap must be of purest quality, guaranteed analyses.
- Small, electric furnace melting units are used to control quality and uniformity to the highest degree.
- Every heat of steel is constantly checked for chemistry, temperature and melting time.
- Preheat and high heat furnaces are guarded for accurate time and temperature to prepare the steel for rolling.
- Percentage of reduction in cogging billets for rolling or forging of bars is skillfully controlled to assure freedom from internal stresses.
- Discs cut from each bar are acid etched, examined, hardened and fractured to certify internal cleanness, soundness, freedom from excessive segregation. And the hot acid etch is backed by Ultrasonic Testing.
- Slugs are cut from each lot of billets and machined in "step-down" fashion to guard against internal seams, shadow lines, etc.
- Extensive laboratory tests are made for proper hardness, micro-structure, grain size.
- Turning tests are run regularly to check cutting efficiency.
- *For best results, put your confidence in . . .*

Carpenter STEEL high speed steels

CYLINDER TUBING

..."mirror-finished" by Standard

Standard "mirror-finished" cylinder tubing is full-finished to use without further sizing or finishing for such applications as *automobile shock absorbers, power steering* and *hydraulic pumps.* When it comes to punishment, it can really take it. Every inch of this rugged tubing measures up to exacting specifications in cylinder finish . . . in ID tolerances as close as .001" . . . in extreme uniformity of wall thickness and concentricity . . . in internal pressure resistance, *tested to shocks up to 9000 p.s.i.* Cylinder sizes to 3" OD x .165" wall. For full information on Standard's complete range of products, plant facilities and engineering assistance send for *free* folder below.

- Welded Stainless Tubing and Pipe.
- Boiler and Heat Exchanger.
- Welded Carbon Steel mechanical.
- Exclusive rigidized pattern.
- Special Shapes

Shock absorber with metal-to-metal plunger in cylinder tube held to .001" ID tolerance. "Mirror-finish", concentricity and precision tolerance makes Standard cylinder-grade tubing usable *as is* for hydraulic and other cylinders.

Free 8-page folder on all Standard products. Write to address below.

STANDARD

THE STANDARD TUBE COMPANY

24400 PLYMOUTH ROAD • DETROIT 39, MICHIGAN

Welded stainless tubing and pipe • Welded carbon steel mechanical • Boiler and Heat Exchanger • Exclusive rigidized patterns • Special Shapes • Steel Tubing—Sizes: ¼" OD to 5½" OD —.028 to .260 wall • Stainless—Sizes: ¼" OD to 4" OD—.020 to .154 wall.

PRODUCTION MACHINERY

GREENLEE

TOMORROW'S MARVEL OF THE ROAD . . .

TODAY A BIG, TOUGH JOB FOR PRODUCTION

Greenlee Ideas, Experience and Facilities Can Help You All The Way

Automobiles . . . airplanes . . . farm machinery . . . appliances. Whatever your product may be, the baffling problems of new model production have a way of disappearing when you invite Greenlee engineers to participate in your planning. These men have a knack (nurtured by long experience) for translating design into profitable, low-cost manufacturing. Their thinking is sound . . . creative . . . respected in many industries. Write or phone for a consultation today. It will pay you to investigate.

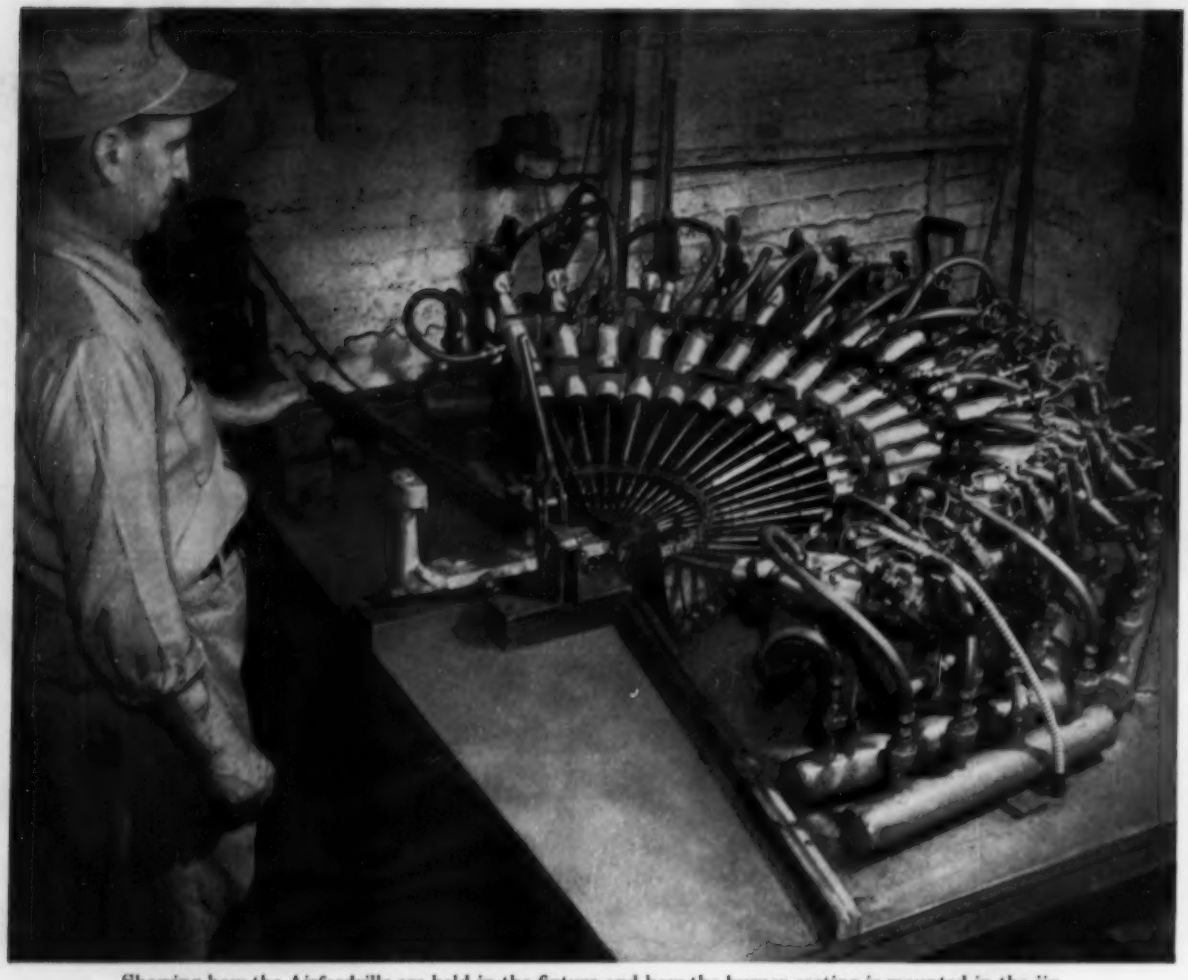
GREENLEE STANDARD AND SPECIAL MACHINE TOOLS

- Multiple-Spindle Drilling and Tapping Machines
- Transfer-Type Processing Machines
- Six and Four-Spindle Automatic Bar Machines
- Hydro-Borer Precision Boring Machines

GREENLEE

GREENLEE BROS. & CO.
1926 Mason Ave.
Rockford, Illinois

Gardner Denver . . . Serving the World's Basic Industries



Showing how the Airfeedrills are held in the fixture and how the burner casting is mounted in the jig. Manifolds, which assure proper air volume, are mounted on the bench around outside of tool fixture.

Press a button . . . 20 drilled holes! Use Keller Tool time-saver Airfeedrills

Hole drilling on this gas burner was a time-killer before Keller Tool Airfeedrills® took over. The job was formerly hand-indexed for each of the 20 holes. The drill press spindle was hand-fed for each hole.

Operator now presses the button on a 4-way air valve. Presto, 20 drilled holes in a 40-second cycle—automatically. The drills start simultaneously, advance, drill the holes, retract and shut off—automatically.

Keller engineering ingenuity + Keller air tools = production cost reductions. How about investigating?

GARDNER - DENVER

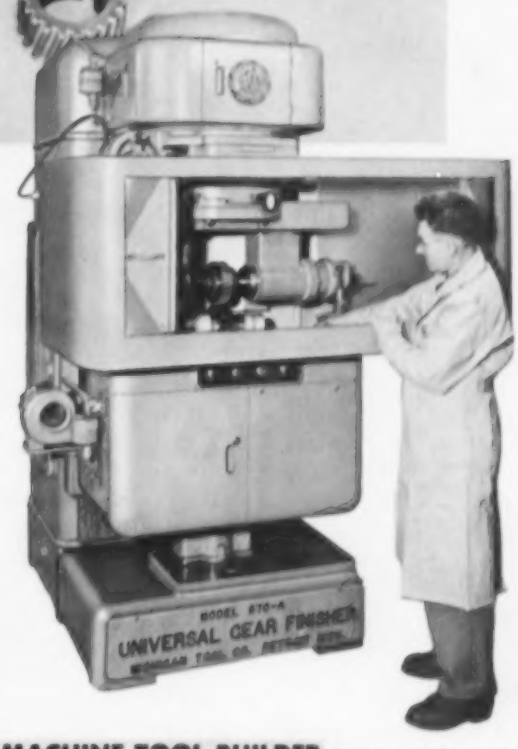
KELLER TOOL division, Grand Haven, Michigan

THE QUALITY LEADER IN COMPRESSORS, PUMPS, ROCK DRILLS AND AIR TOOLS FOR CONSTRUCTION, MINING, PETROLEUM AND GENERAL INDUSTRY

This Month's

GEAR PIX

LATEST GEAR-O-MATION® equipped Michigan 870 gear shaver finishes 18-tooth automotive pinions at 260 per hour. Features are: hopper feed, automatic load and unload, pneumatic headstock and tailstock, 3-way classifier with automatic feedback maintaining correct center distance, desired accuracy and production requirements preset on control panel, more accurate gears produced.



MACHINE TOOL BUILDER shaves a wide variety of gears (a few are shown) on this Michigan 870-A gear finisher. Underpass is used for shoulder cluster gears, while the transverse method, in combination with crowning, is favored for shaving wide face spur and helical gears. This 870-A has an 18-inch capacity, which covers practically all requirements for this Illinois firm.

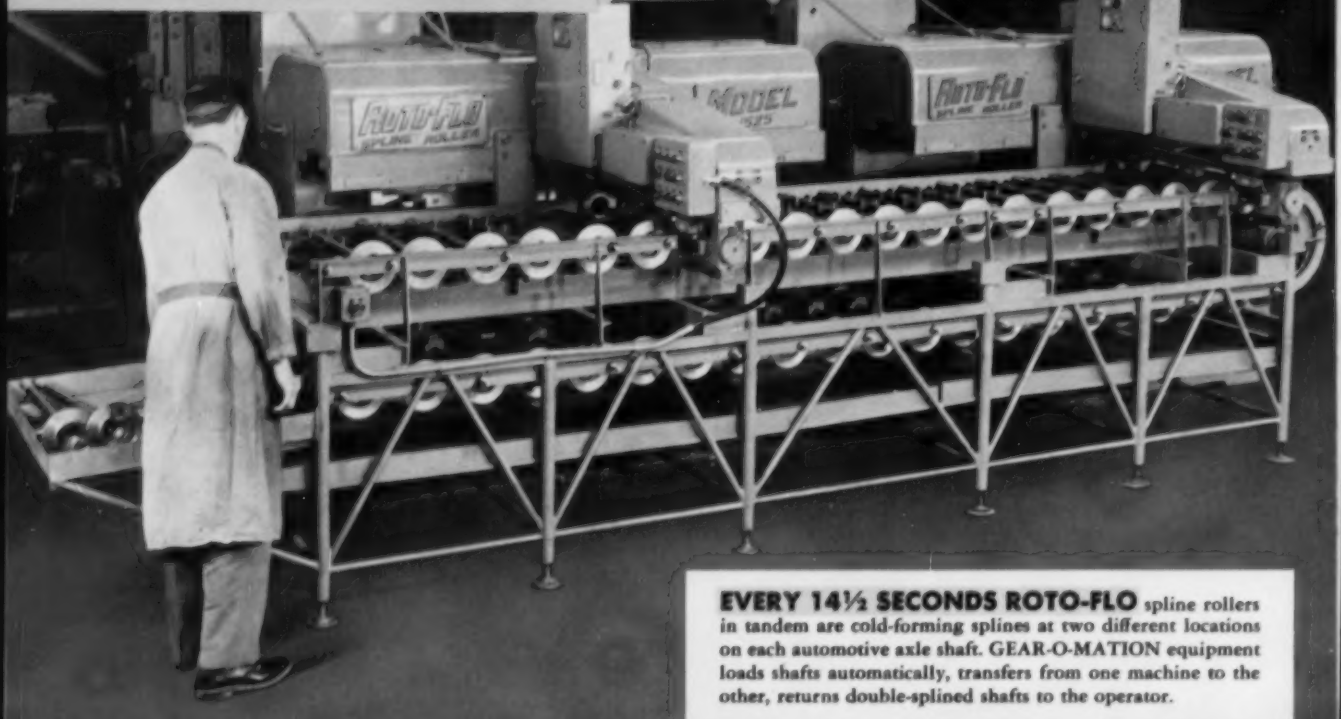
MICHIGAN TOOL COMPANY

7171 E. McNICHOLS RD. • DETROIT 12, MICH.

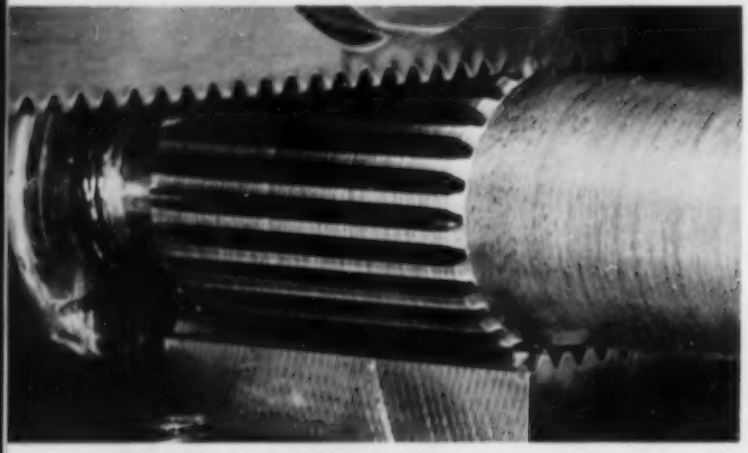
IN CANADA: COLONIAL TOOL CO., LTD.

This Month's

GEAR PIX



EVERY 14½ SECONDS ROTO-FLO spline rollers in tandem are cold-forming splines at two different locations on each automotive axle shaft. GEAR-O-MATION equipment loads shafts automatically, transfers from one machine to the other, returns double-splined shafts to the operator.



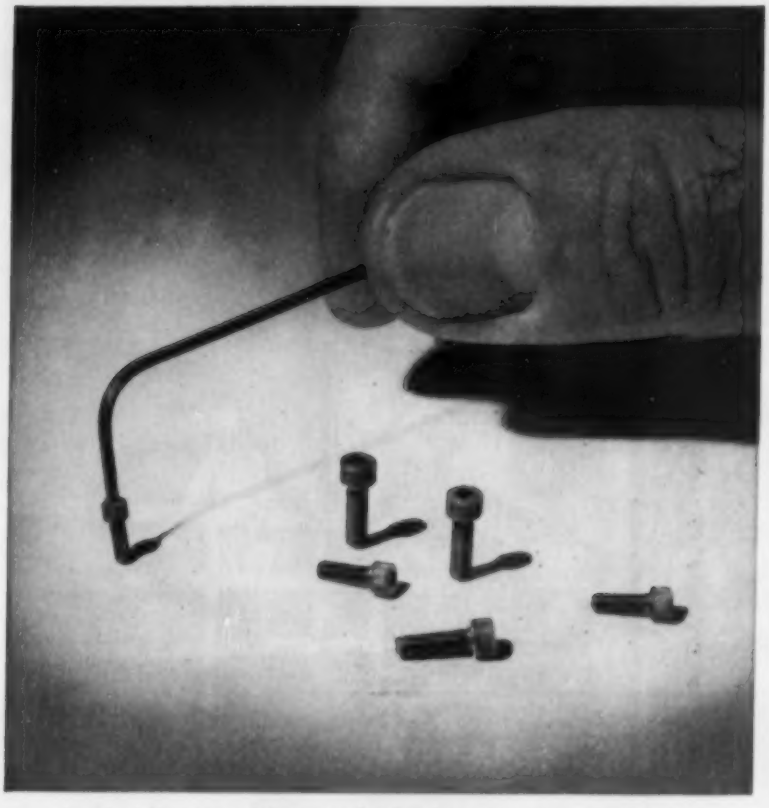
ROTO-FLO FORMED SPLINES, just coming off the forming racks. Actual forming process takes 4 or 5 seconds—floor to floor time is 10 to 15 seconds. Cumulative spacing error is less than .0015 inch—compare it to your present spline manufacturing.

COLD-FORMED HELICAL TEETH (by ROTO-FLO process), as shown here, have a very high degree of accuracy. Note the sharp, square corners at the top of the teeth, the 3 to 6 micro-inch finish on the tooth form. Compare the few seconds required to produce parts like these with your present production on similar parts.

MICHIGAN TOOL COMPANY

7171 E. McNICHOLS RD. • DETROIT 12, MICH.
IN CANADA: COLONIAL TOOL CO., LTD.

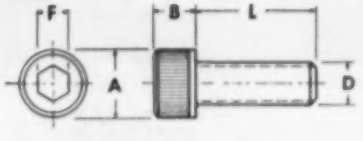
Miniature screws aid standardization of small devices



Standard UNBRAKO miniature socket head cap screws are available in sizes # 0, # 1, # 2 and # 3, in heat treated alloy steel or stainless steel, at your authorized industrial distributor's. Standard lengths range from 1/8 to 1/2 in.

HEAT-TREATED ALLOY STEEL

Class 3 Fit Standard



Diameter		Threads per Inch NC	Threads per Inch NF	Length	Recommended Installation Torque in Inch-Pounds NC	Recommended Installation Torque in Inch-Pounds NF	Weight per 1000 in Pounds
#0	A .104		80	1/8		2.0	.152
	B .060		80	3/16		2.0	.182
	D .060		80	1/4		2.0	.210
	F .050		80	3/8		2.0	.265
#1	A .118		72	1/8		3.5	.27
	B .073		72	3/16		3.5	.32
	D .073		72	1/4		3.5	.37
	F .050		72	3/8		3.5	.47
#2	A .140	56		3/16	6.0		.42
	B .086	56		1/4	6.0		.50
	D .086	56		3/8	6.0		.58
	F 1/16	56		1/2	6.0		.70
#3	A .161	48		3/16	8.5		.59
	B .099	48		1/4	8.5		.70
	D .099	48		3/8	8.5		.81
	F 5/64	48		1/2	8.5		1.03

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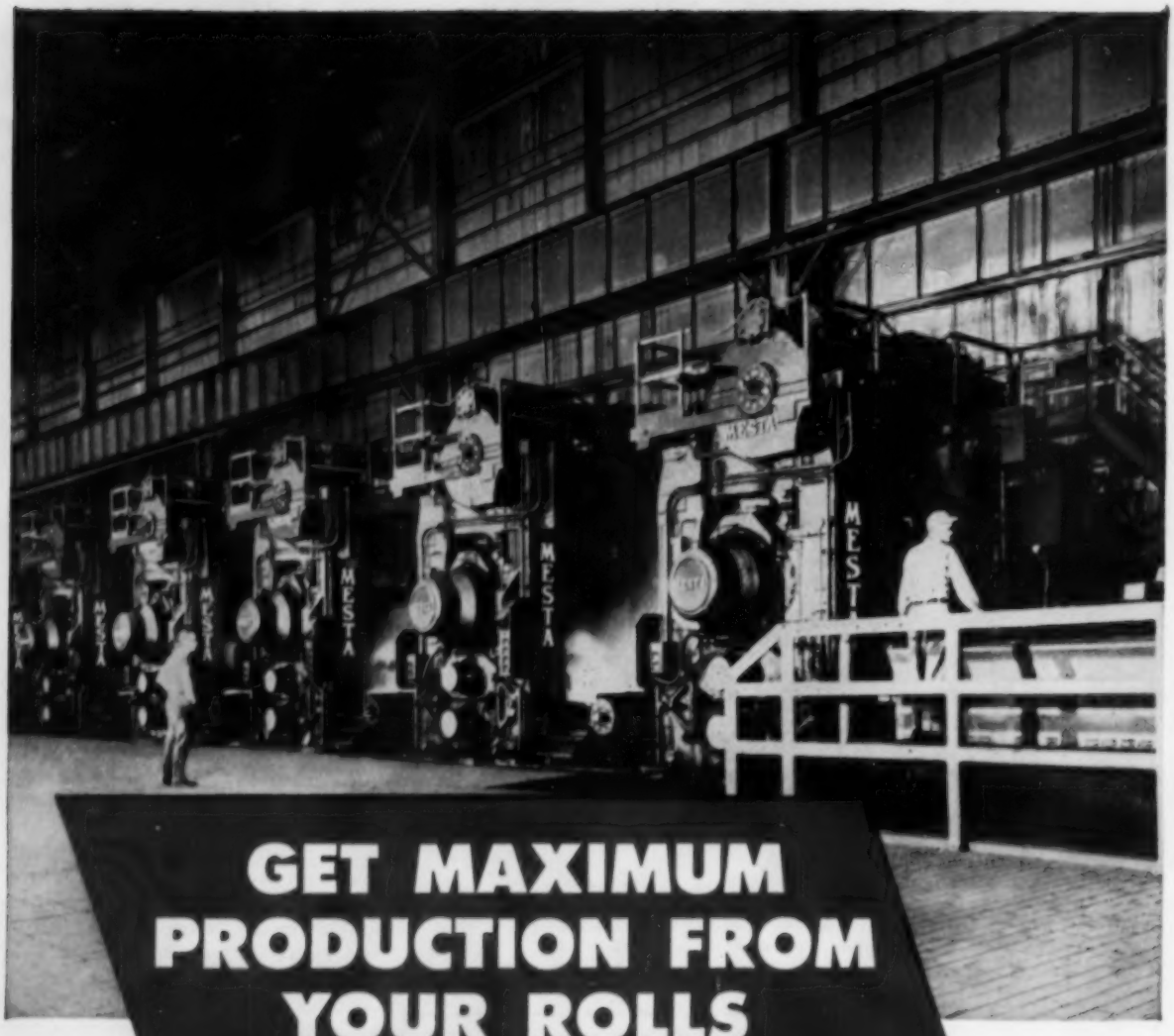

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STEEL

June 11, 1956

Metalworking Outlook

Memo on Steel

Strike talk has quieted down slightly in steel. The shift in mood stems from the move of negotiations from Pittsburgh to New York and from the agreement by U.S. Steel Corp., Bethlehem Steel Co. and Republic Steel Corp. to join in talks with the union. The three will still bargain separately, but the joint parley should speed proceedings. Negotiations resumed in New York last Wednesday. Brass-tack bargaining will begin shortly.

States Can Curb Labor Violence

The Supreme Court has ruled that states may ban, under state law, unfair labor practices carried on by a union against a company involved in interstate commerce. By a 6 to 3 vote, the justices upheld a Wisconsin Supreme Court ruling which banned the United Auto Workers from pursuing unfair labor tactics in its 26-month strike against Kohler Co.

Action on Nickel

Where, oh where, is the nickel going? That question brought action from the Office of Defense Mobilization which makes nickel alloys a controlled material under the Defense Materials System. Plans call for controls to apply to defense orders to be delivered beginning in the fourth quarter. Set-asides will be established similar to those in effect for steel, copper and aluminum. The Pentagon's take of scarce nickel for about a year has far exceeded estimates. Defense planners hope this action will give them a closer look at where nickel is going—especially since defense needs, on a high plateau for some months, may increase still more.

Why Nickel Estimates Go Wrong

Why the erroneous estimates of defense requirements for nickel? Government men present these reasons: 1. Some contractors have been using more nickel than necessary to meet specifications because it was easier than trying to substitute. 2. To obtain aircraft performance of the order demanded by the military, it's sometimes necessary to use more nickel than expected. 3. Estimates take form some 12 months in advance; in the meantime, crash programs are initiated that sometimes are not taken into account.

Impact of Roads

The giant federal-state highway program will do far more than just spur production of materials and equipment. It may change the geography of industry itself. A case in point is northeastern Ohio (page 67). The new Ohio turnpike and the proposed North-South thruway are credited with a major role in attracting 4.1 per cent of total national expenditures for new plant and equipment last year to an area that has only 2 per cent of the industrial capacity and 1 per cent of the population. The $37.2

billion program voted by the Senate would also boost road machinery sales 15 to 20 per cent; paving material volume, 10 to 15 per cent; and structural steel requirements, 200 per cent.

Auto Prospects

Look for 445,000 to 450,000 automobiles to be assembled in the U.S. in June. That's some 17,000 units less than preliminary May production estimates and compares with nearly 650,000 cars built last June. The cutbacks should reduce new car stocks to 750,000 by the end of this month. July and August production won't be high either, so dealer stocks may dip to 550,000 by Sept. 1. Inventories are around 900,000.

Merger in Titanium

Republic Steel and Crane Co. will join as equal partners in Cramet Inc., which had been a Crane subsidiary producing titanium sponge at Chattanooga, Tenn. The move makes Republic an integrated titanium producer, for it already has rutile (titanium ore) deposits and has been making titanium mill products. Crane controls rutile deposits, too, and makes titanium valves and fittings. The Chattanooga plant is in partial production; full capacity of 6000 tons of sponge annually is scheduled to be reached soon. U.S. says it won't block the deal which was pending for months.

Expansion in Power

Expect American power companies to spend some $40 billion on expansion in the next decade. Edison Electric Institute's president, Harlee Branch Jr., says the outlay will double capacity. Included in plans are seven full-scale atomic power plants.

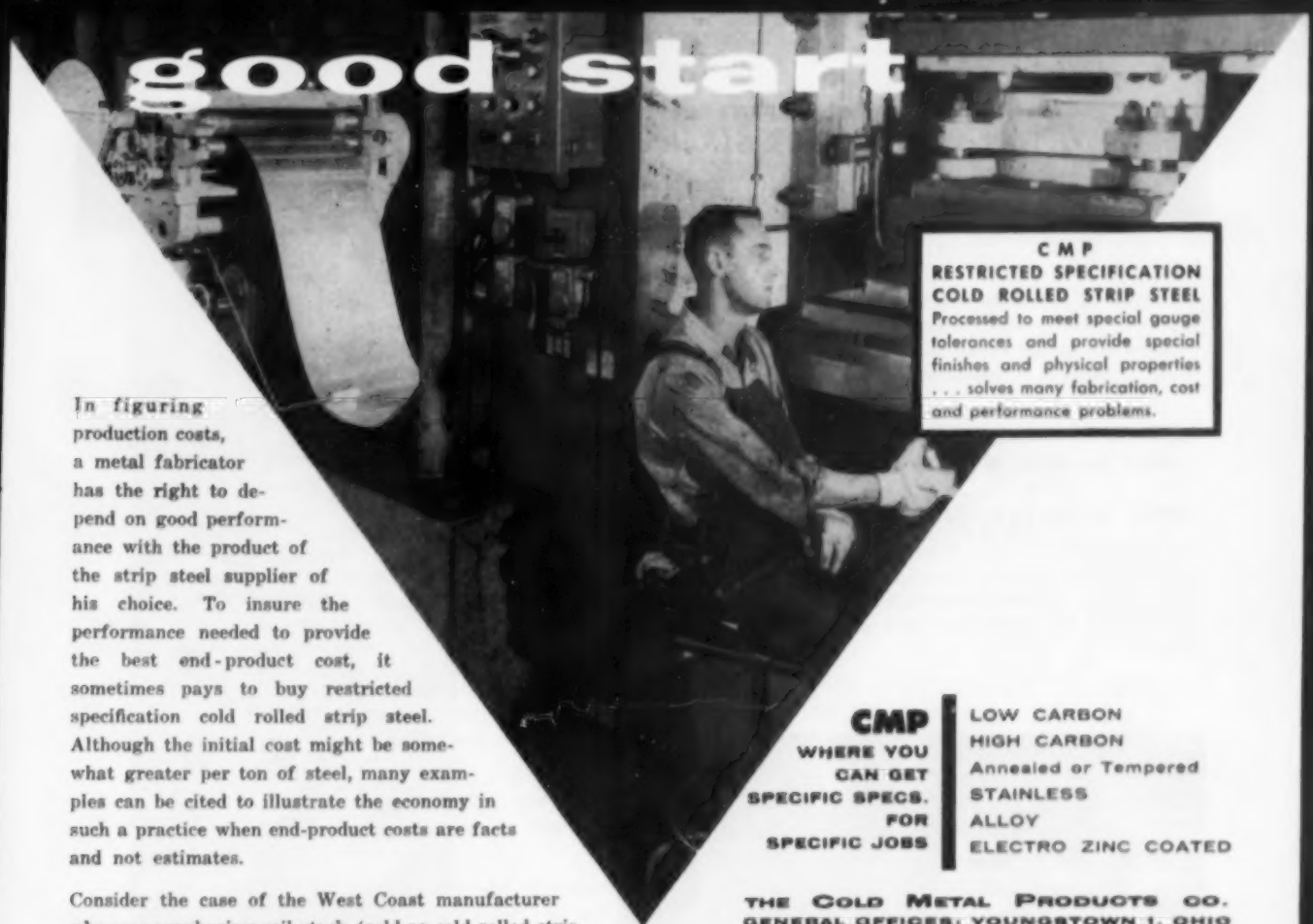
West Germans Expand Steel

West Germans plan to have enough steel capacity to produce 35 million net tons of ingots in 1960, compared with the current capacity of 26 million tons annually. They'll spend 1 billion marks a year to do it. West German steel capacity is now 142 per cent of the 1936 potential, compared with 163 per cent for Luxembourg, 167 per cent for Great Britain, 185 per cent for Belgium, 188 per cent for France, 267 per cent for Italy, 277 per cent for Russia and 217 per cent for the U.S. Germans may go abroad to expand, too. Krupp plans a major steel plant near Cornwall, Ont., on the St. Lawrence . . . Despite the steel shortage, West Germans have sold 77,000 tons of strip, sheets, bars and rolled steels to the Soviets, with deliveries extending into the fall.

Straws in the Wind

Look for 12 million used cars to be sold this year, about the same as last . . . American Machine & Foundry Co. will join with the engineering firm, Mason & Hanger-Silas-Mason Co. Inc., to build an underground plant near Huntsville, Ala.; the companies believe construction and maintenance costs will be lower than those of a surface plant . . . Ford Motor Co. says current production schedules for the Continental call for six cars a day.

good start



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Electric Pole and Line Hardware
Furnace Air Filter Frames
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Handling Unlimited

Unless your plant is a notable exception, the cost of handling incoming raw materials through processing to the finished product can be as much as 30 per cent of your total manufacturing costs.

Your percentage is likely to move higher in the coming weeks because of the new round of wage increases in the making. For the long term, the upward trend will continue.

This move toward larger labor content in the finished product was the principal reason for the unprecedented interest in the displays of 160 handling equipment makers at the Material Handling Institute's show in Cleveland last week.

Material handling, the movement of work in process, has become a full-fledged production operation. Ideally, an all-out attack on this major cost item would entail the construction of an entirely new plant conceived as an integrated "machine." It would start with the redesign of the product for the most economical use of materials and production methods.

If a part for that product were a stamping, for example, it would start out with a coil of steel, brass or aluminum. The material would be decoiled, leveled, measured, blanked, formed, counted and piled ready for movement by conveyor lift truck to the next operation.

Perhaps the movement of another part would call for the use of overhead cranes equipped with remote controls or interlocks; or a trolley conveyor providing for automatic storage between operations; or a magnetic tape controlled conveyor system that would distribute in any desired sequence.

But say you can't start from scratch. Whether you have a one-floor plant, multiple floors or chopped-up work space, check your production layout to see if handling can be improved between machines. It is one big area for real savings. It can mean increased productivity, improved working conditions, less in-process inventory and lower cost of the finished product.

Now is a good time to take a fresh look at your material handling costs. Opportunities for improvement are unlimited.

Irwin H. Such

EDITOR-IN-CHIEF

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New auto, metalworking plants follow roads as . . .

Northeastern Ohio Expands

"IN 1955, northeastern Ohio, with 1 per cent of the nation's population and 2 per cent of its industrial productive capacity, received 4.1 per cent of national expenditures on new plant and equipment," says Elmer E. Lindseth, president, Cleveland Electric Illuminating Co.

A major reason: Roads. Industrial development men agree that good roads are a key to future plant locations. The federal program that will link 90 per cent of the nation's cities of more than 50,000 population is bound to influence metalworking expansion, experts agree.

Cases—Ford, Chrysler and General Motors vote for this thinking, too. Their new auto plants in northeastern Ohio are all near the Ohio turnpike. Since it was completed and the new north-south turnpike proposed (see map), more than 68 other companies have started negotiations for plant sites.

Other selling points beef up the potential of the expansion. Steel is fed into the area at short-haul rates from Cleveland, Youngstown and Pittsburgh. Aluminum, of increasing importance to auto and other metalworking groups, will soon be flowing plentifully from the Ohio valley. Rail networks are established. Lake Erie, now a readymade route for cheap raw materials, will look even more attractive in 1959 with the advent of the Seaway.

Diversification—Growth will be from a solid base. Greater Cleveland is at the center of a 500-mile radius which touches almost 60 per cent of our population. It produces one-fifth of our vacuum cleaners; one-sixth of our bolts, nuts and washers; one-sixth of our industrial trucks and tractors; and about one-tenth of our malleable iron, brass, bronze and aluminum castings.

Cleveland is strong in other metalworking products. It's second only to Cincinnati in machine tools and industrial machinery. It's the largest producer of jet engine parts and supplies 25 per cent of all parts and accessories used by aircraft manufacturers.

More Roads—Prospects are good that the area's transportation network soon will get another major artery. A 1959 deadline is set for completion of a north-south turnpike, routed from the Pennsylvania line parallel to Lake Erie, and cutting south to Cincinnati about 20 miles from downtown Cleveland.

It will form the base for a new plant complex stretching along the lake from Cleveland to Ashtabula, perhaps even farther east.

Foundation—Beginnings of the new complex are already there. The U. S. Industrial Chemical Co.'s new plant may help Ashtabula realize its goal. It has its sights set on becoming the world's center of zirconium production. At the moment, Electro-Metallurgical Co., a division of Union Carbide & Carbon Corp., is getting its titanium plant at Ashtabula into full operation.

Even more dramatic possibilities are in the offing. A new auto assembly plant in addition to the already announced Chevrolet facility at Lordstown, would be a logical bet for northeastern Ohio. And it's an obvious first choice for a new steel mill. Steel's next expansion round will call for facilities built from the ground up. U. S. Steel Corp., Pittsburgh, owns 7000 acres of lakefront property near Ashtabula. Cleveland Illuminating has

another 2000 acres for interested bidders. Docking facilities would be easy to build. One attraction: Cheap Labrador ore.

Impetus—In addition to encouraging component makers and other supplier industries to expand, the auto plant location will spotlight the area's desirability to other metalworking groups. Another big boost is to be expected from local business groups, organizing to back the recruitment of new industry.

Many established firms have been reluctant to welcome newcomers. With auto companies especially, it was thought, would come higher wages and new labor problems. Now that auto neighbors must be accepted as a fact of life, coolness is expected to give way to a desire to make the most of the chance to expand local markets.

Support — Top management is coming around. Business is forming development groups in Akron, Youngstown and Ashtabula, as well as in Cleveland. The Seaway, for example, will at last get active support from Cleveland business. A promotion committee made up of top industrial leaders has been formed.

Progressive companies are already making test runs. Lincoln Electric Co., Cleveland, sent all the equipment for its new French plant by boat from Cleveland, and has shipped a cargo of welders to South Africa by the same route. "Since the shipment was handled by an agent," says a company spokesman, "we don't have a breakdown of the savings over conventional shipping." But it's a safe bet that Lincoln will be shipping more of its output by the same route.

Outlook — As Mr. Lindseth affirms, northeastern Ohio is already growing faster than the national average. In 1952, manufacturers spent $404 million for new plant and equipment in CEI's service area. Last year, national capital spending dropped slightly from the '52 level. The CEI area gained 10 per cent.

The gap should continue to broaden. A corridor of plants from Cleveland to Akron is already becoming a reality. Another from Cleveland to Ashtabula may not be too far away.

Looking Ahead 40 Years

Expected national output of $1.2 trillion by the end of the century will increase living standards 70 per cent. Population will be more than 300 million

"OUR COUNTRY is growing so fast that we must be prepared to meet the needs of another America, almost as large as our present one, by the end of the century," declares John S. Sinclair, president of the National Industrial Conference Board.

The Goal—Mr. Sinclair counsels a combination of initiative and prudence to reach a national output of $1.2 trillion in 40 years. The board points to this goal if the rate of increase during the last 50 years is maintained. The nation's output of goods and services has increased about 3 per cent a year.

Living standards can be about 70 per cent higher in 1996 than they are today, even though almost twice as many Americans will be around to share in the nation's production. Population then will be over 300 million if growth continues at its recent rate of 1½-per cent a year. (We now number over 167 million—35 million more than in 1940, when the baby boom started.)

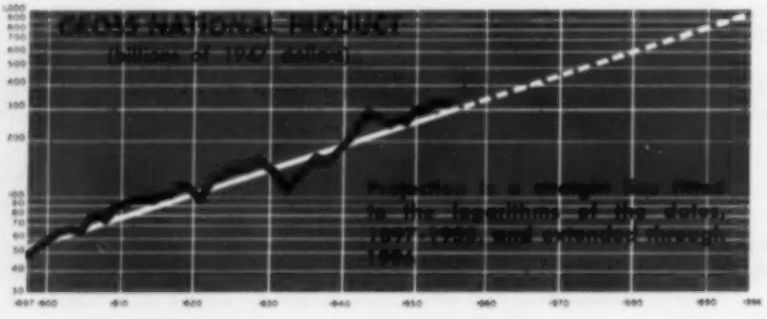
90 Million Jobs?—About 25 million workers entered the nation's labor force between 1920 and 1955. Population forecasts predict another 25 million will be added by 1975 to bring the total to 92 million. Increasing employment of women has made a striking change in the composition of the work force. In 1920, fewer than one out of four women worked. By 1955, one in three worked. Almost two out of five are expected to be working by 1975.

Better Pay—An increase in family income has converted costly luxuries into common conveniences. In 1916, only one out of ten families owned an automobile. Now, nearly that many have two cars or more. At the beginning of 1956, 97 per cent of U. S. families owned radios, 90 per cent had refrigertors, 80 per cent owned electric washers and 72 per cent had TV sets.

After buying food, clothing and housing, the average city worker's family in 1950 had 42.8 per cent of its income left for optional purchases—such as automobiles, appliances and recreation. In 1917-1919, only 22.1 per cent of spending was optional.

Taxes and Debt — The growth and cost of government have outstripped many of America's increases. Although national income has jumped 422 per cent since 1922, the total tax burden is 968 per cent greater.

The Conference Board says that total debt has risen in all but five of the last 40 years. Last year, our debt rose nearly $50 billion under the impetus of heavy private borrowing. The Conference Board notes that while our traditional willingness to borrow against future income has made a fundamental contribution to America's growth, the $650 billion debt we carry poses challenging problems for the future.



How To Prepare Your Employees For Retirement

1. Set up a formal preparation-for-retirement program
2. Make one man or a committee responsible for its operations
3. Seek the advice and co-operation of outside agencies (universities, welfare groups, Golden Age clubs)
4. Provide trained personal counseling in health, hobby and financial problems
5. Begin the program soon enough (five to ten years before the employees' normal retirement ages)
6. Clear the program's activities with your union
7. Train your foremen and supervisors in the objectives of the program
8. Get your employee publications behind the program
9. Be careful to draw the line between good retirement preparation and too much planning for the employee: Self-reliance applies here, too

Workers Prepare To Retire

Metalworking companies are among the leaders in the new movement to help employees enjoy a fruitful retirement period. There are benefits for the company, too

THE GOLD WATCH is ticking off happier retirement hours for many ex-metalworking employees these days. They have been prepared for retirement by their employers.

A recent National Industrial Conference Board study shows 34 of 327 firms formally aided employees in the solution of problems about Social Security benefits, pensions, health, hobbies and other leisure time activities. Another 180 companies offer informal pre-retirement counseling.

Company Benefits—"The emotional satisfaction an employee receives from a pre-retirement program should make him a better, more contented worker. The calming down of retirement blues should help maintain his level of productivity, particularly after reaching the middle years," says Joseph C. Buckley, author of *The Retirement Handbook*.

L. W. Binger, personnel services manager, Minnesota Mining & Mfg. Co., believes happy retired workers spread the word of 3M's interest in their welfare, creating better public and employee relations.

Tapering Off—Companies which like to place their older workers in less demanding jobs find them willing and even eager if they have been prepared for the change by pre-retirement counseling. Job switches make promotion plans easier to operate, too.

More workers will retire at or near the normal retirement age when they are properly counseled. Firms with flexible (rather than compulsory) retirement ages sometimes are charged with discretionary action by their unions or the workers themselves when they request less efficient workers to retire.

In the case of compulsory retirement plans (STEEL, June 4, p. 61), one metalworking executive believes pre-retirement programs are absolutely necessary to soften the blow of the gold watch and final hand shake.

Self-Reliance—How far should a company go when it starts to assume the additional responsibility of preparing its workers for retirement?

"Self-reliance has as proper a place here as it does at other times of life. We must not fall into the difficulty of having people think we are taking over their planning for them. This would be fatal," warned the 1952 National Conference on Retirement.

Comments Joseph J. Morrow, personnel relations director, Pitney-Bowes Inc.: "We believe that giving the individual constructive help with his planning is as much a proper industrial function as is the provision of pensions. This is part of a total responsibility which, in these times, crosses the boundaries of simple profit making into social and economic areas which affect the well-being of the community and of the nation."

How It Works—Personal interviews and group discussion are the techniques of pre-retirement programs. The personal interview allows the worker to express his more private problems and gain experienced advice from trained counselors.

Group discussion creates group feeling. The worker realizes he is not alone in his problems.

Bell & Howell Co. and Republic Steel Corp. use programs developed by the Industrial Relations Center of University of Chicago. Other firms have created their own plans.

Bell & Howell served as the guinea pig for the Chicago plan, reports W. L. Johnson, vice president, industrial relations division. "As a result, a number of our employees who are well up in years have voluntarily retired much sooner than we had previously anticipated."

Harold C. Lumb, general counsel, Republic, has the plan operat-

ing in Cleveland and says it will be extended to other plants if it continues to go well.

Early Enough—General Electric Co. recommends that retirement counseling should begin when the employee joins the company and continue informally throughout employment. G. Roy Fugal, employment practices manager, says: "In general practice, retirement plans should be discussed ten to five years before retirement. In a broader sense, as a man enters the employ of GE, he should be briefed on the many benefits of working for the company, which includes a thorough explanation of our pension programs."

Pitney-Bowes has an initial interview with the employee at 55, with follow-up interviews every two years until he reaches 63, then annually until 65.

Minnesota Mining & Mfg. has a first interview at 60. After that, employees are seen once a year until 63, then every six months until their retirement date is established.

First Interview—Any pre-retirement program will stand or fall as a result of the first interview. The employee may be suspicious of the company's motives for offering such aid. Trained counselors direct the employee's attention to a long-range look at his retirement future.

At 55 or 60, most workers are dimly aware that their retirement income isn't going to match their present salary or wages, but they don't want to face the facts: So they tend to resist all thought of retirement. When the financial picture is spelled out in a friendly and confidential way, they are ready to start thinking about the more pleasant side of retirement (community work, time for the family, travel, hobbies and rest).

Chicago Plan—The crux of the University of Chicago's program is the group discussion. Bell & Howell invites employees near retirement age to attend 11 seminars on retirement. Each meeting considers a specific aspect of retirement; questions are encouraged by trained discussion leaders.

Mrs. Helen Randall of Cleveland's Welfare Federation wants the wives to be remembered, too. In one sense, the retiree (if male) is returning to the woman's world he left when he joined industry. There's an emotional problem with the wives: "I don't know what I'll do with Joe hanging around the house all day." Wives are invited to Republic Steel's retirement sessions.

Results—"When a session is first announced," says Bell & Howell's Mr. Johnson, "we do get some negative reactions from our older employees. Many people refuse to face the fact that they are approaching retirement age, and others just don't want it known to their fellow employees. Once they begin the program, the change in attitude is quite gratifying."

And says Pitney-Bowes's Mr. Morrow: "We believe our program is stimulating our employees into preparing for their own retirement, which, in the last analysis, is the only effective way."

• *An extra copy of this article (and the article, "New Look in Retirement," which appeared last week in* STEEL*) is available until supply is exhausted. Write Editorial Service,* STEEL*, Penton Bldg., Cleveland 13, O.*

Older workers create special problems

SUB in Europe

European Community will pay nearly $6 million to aid laid-off Italian steelworkers

THE High Authority of the European Coal & Steel Community in Luxembourg has given 1000 million lire to the Italian government to aid 8000 steelworkers put out of work by modernization. The sum is an advance on a total of 3500 million lire (nearly $6 million).

The aid is part of the Europepean Community's readaptation program planned to insure that the brunt of re-equipment and modernization in the six-nation common market is not borne by the workers.

(Since the start of the common market, Italian steel production has risen about 60 per cent. In 1955, it hit 5½-million tons.)

Incentive—The Italian workers will be paid a "waiting allowance" which starts at 35,000 lire ($60) a month and is payable at a declining rate for up to 15 months. Maximum allowance: 380,000 lire. Workers are encouraged to train for new jobs by paying them the full allowance while in training courses.

Single workers who have to move to get a new job will be given 100,000 lire ($160). Married workers get 200,000 lire, plus 25,000 lire for each child. Moving expenses are also paid.

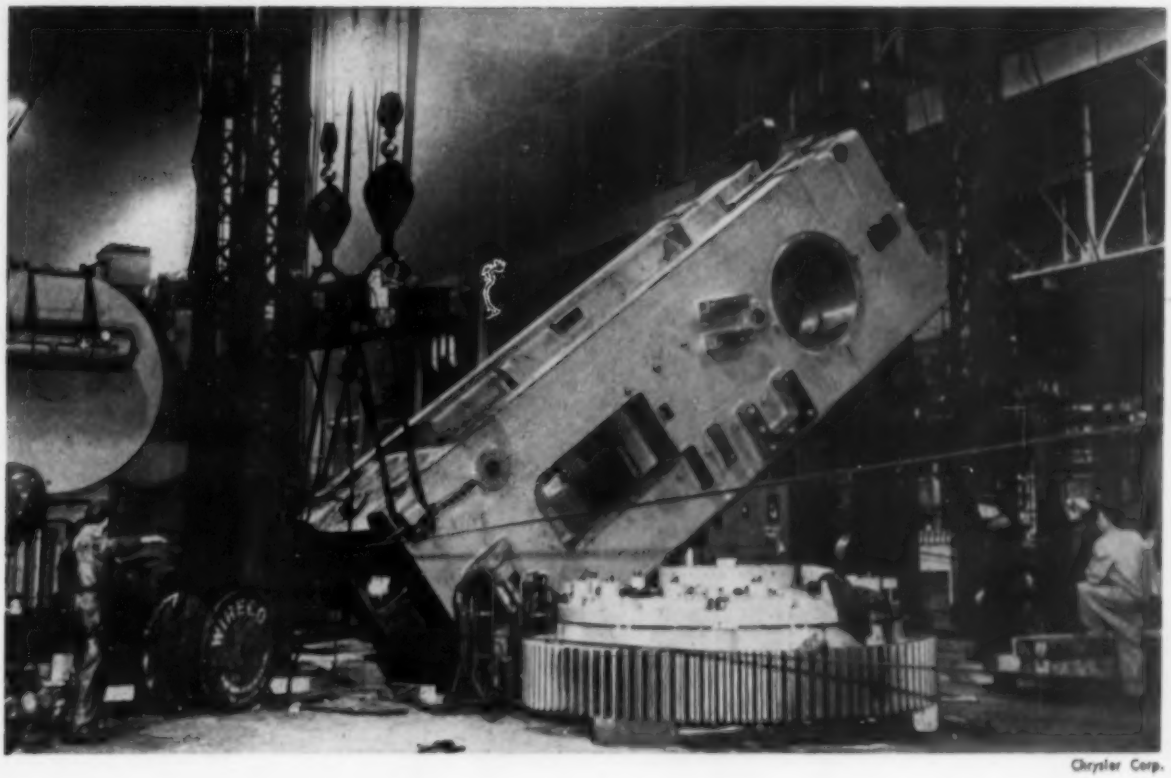
Part of the 3500 million lire can be used to aid vocational training centers.

More Canadian Ore

A $16-million ore project near Bristol, Que., is expected to produce pellets containing about 66 per cent iron at the rate of 600,000 tons a year.

The Hilton mine, discovered about 1870 but never worked on a commercially practical scale, is to be developed by the Steel Co. of Canada Ltd., in association with Pickands Mather & Co., Cleveland, and Jones & Laughlin Steel Corp., Pittsburgh.

Construction, which starts this summer, is expected to be completed in 18 months.



Chrysler Corp.

Erectors Expect Best Year

Next year looks even better. Long range industrial expansion plans assure industry of continued good business. Material shortages and labor pose biggest problems

MACHINERY erectors are riding the crest of the industrial expansion wave and expect to post a new high mark this year. Most estimates put business at least 20 per cent above last year's—and it holds the record.

The last three years have been big ones for most erectors. One prominent spokesman for the industry says 1957 looks even better than 1956. His backlog of orders is 20 per cent bigger than it was a year ago, and he has had 25 per cent more jobs to bid on this year. About the only if: Slow deliveries of equipment from manufacturers who are log jammed with orders and in some cases handicapped by material shortages.

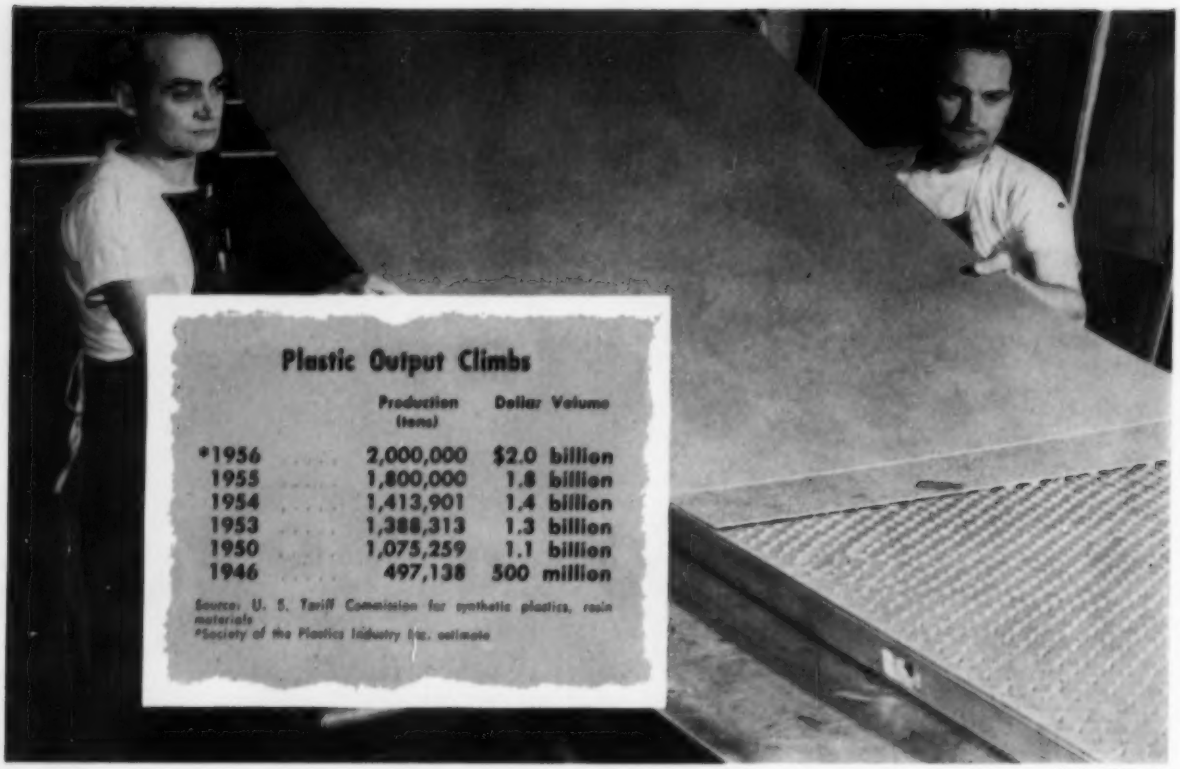
Good Future—The steel industry is one of the most active sources of business for machinery erectors. During 1954 and 1955, most of the work for steelmakers involved rounding out the Korean War expansion. With the industry launching a new and bigger long term program, erectors anticipate lush contracts for at least the next three years.

The automotive industry is also a good customer, especially for midwestern erectors. This expansion is expected to run at current levels until about 1958. Other major customers include plastic makers, aluminum and brass mills, rubber and chemical companies and sheet metalworking plants. One of the biggest boons to the business is the drive for automation.

Numbers—There are about 100 companies classified as erectors, with about 20 or 30 doing the bulk of the business. This group grosses about $150 million a year. The mobility of the business is the cause of two of its greatest troubles—scheduling and labor. Erection firms move all over the country, wherever the job happens to be. They have to get their equipment and men at the right place at the right time.

But labor is the real headache. Erectors usually have to recruit a considerable amount of local labor as they skip from site to site, mostly craftsmen. Many localities don't have such labor available. So good field superintendents are a requisite. They keep the job going, training men in the process.

Good, steady business is the best aspirin for those headaches. One erector figures that for new plant installations with new equipment, 10 per cent of the total industrial construction contract is for machinery installation. With capital expenditures and industrial construction headed upward for the long term, there should be no shortage of "aspirin" for erectors.



Plastic Output Climbs

	Production (tons)	Dollar Volume
*1956	2,000,000	$2.0 billion
1955	1,800,000	1.8 billion
1954	1,413,901	1.4 billion
1953	1,388,313	1.3 billion
1950	1,075,259	1.1 billion
1946	497,138	500 million

Source: U. S. Tariff Commission for synthetic plastics, resin materials
*Society of the Plastics Industry Inc. estimate

U. S. Rubber Co.

Metalworking gets cost cuts, help with new markets as . . .

Plastics Go Industrial

REINFORCED, coated and sheet plastics are ready to serve metalworking.

While winding through the 230 exhibits this week at the Plastics Exposition in New York, you will see products made by using plastic drop hammer dies. Made of epoxy compounds, these dies can withstand repeated impact and shock while forming sheets of annealed steel, stainless or aluminum on conventional metal presses. Claims the diemaker: "The cost is one-fifth as much as steel dies, and we can cut delivery time some 70 per cent. We feel we have the solution to short runs."

Flying High—Bakelite Co., division of Union Carbide & Carbon Corp., is explaining to onlookers at the show that aircraft applications for reinforced plastics are mushrooming. Example: Lockheed Aircraft Corp., in getting its new turbojet into production (Hercules C-130), estimates that out of 50,000 parts being used (excluding nuts, bolts and rivets), some 10,000 components are being made with plastic tools, dies, jigs and fixtures.

Plastic Paneling — The use of plastic sheets bonded to ferrous and nonferrous metals for strength is opening up new markets for metals and plastics. A sheet of aluminum can be covered with a sheet of vinyl plastic (on display at the U. S. Rubber Co.'s exhibit) to become the outer face of a flush metal door (see photo). Used as wall paneling, the sheet materials can be produced in a variety of colors and simulated fabrics. Advantages: 1. Coated metal is unaffected by moisture, will not peel, crack or support combustion. 2. Plastic coated metal sheets can be sheared, crimped, bent, drilled and punched with standard tools without separating the plastic vinyl from the metal.

Plastisols — Metal & Thermit Corp. explains that low cost plastisols (dispersions of finely powdered vinyl resins in plasticizers) can be used to protect the interiors and exteriors of such items as rinse and electrocleaning tanks for the same amount of money it formerly took to protect only interiors. The introduction of strippable plastisols is causing a stir throughout motordom. The product is being used to protect highly polished chromium and stainless steel auto parts prior to use.

Appliances, Too — Appliance makers are studying the possibility of using various types of plastic sprays, coatings and sheeting materials to glamorize new lines. It is anticipated by some advocates that several new TV models will be made with metal cabinets, coated with vinyl. Sheet plastic producers point out that refrigerator fronts could be decorated with removable

sheets of plastic. This would allow color changes.

Corrosion—Plastics, to help fight corrosion, continue to stir interest. Metalworking men are seeing displays of how plastics can be used to protect drums, pipe, storage tanks, etc. Sample: The Dow Chemical Co. display provides information on plastic lined cast iron and steel pipe, fittings and valves.

Outlook: Plastic coatings will show a 25 per cent sales gain this year. Reinforced plastics will gain at least 30 per cent. "And improved standards," says the Society of the Plastics Industry Inc., "will help us to develop better relations and more uses for plastics in metalworking."

Gearmakers Optimistic

Gearmakers expect their volume this year will be 10 per cent higher than last year's—quite a feat when you consider that 1955 volume was 31 per cent above that of 1954 and 20 per cent over that of 1953.

Firm backlogs assure a satisfactory volume of business, not only for the remainder of this year but also through April, 1957. That was the consensus of members of the American Gear Manufacturers' Association at their annual meeting at Hot Springs, Va., June 3-6.

Because the bulk of their orders are for the capital goods program, gearmakers have no fear they will be washed out in the softening apparent in the automotive and some other consumer goods industries.

While volume is satisfactory, profits are less so. Gearing prices have been remarkably stable, while labor, materials and other costs have advanced substantially.

Shortages of some forms of steel, particularly nickel alloy forgings and chrome-molybdenum types, have led the more progressive gear manufacturers into using specially treated alternate materials with marked success. Others are investigating new methods of heat treating, using less critically short steel.

The new AGMA president will be Gunnar E. Gunderson, president of Brad Foote Gear Works Inc. Vice president: LeRoy R. Brooks, president of Tool Steel Gear & Pinion Co. Treasurer: Thomas A. Jones, general manager of Hewitt-Robins Inc.'s Jones Machinery Division.

MHI Forecasts Best Year

The industry expects sales this year to hit $1.5 billion, compared with $1.2 billion last year. Show visitors saw over 1200 pieces of new equipment

YOU COULDN'T find much pessimism at the Material Handling Institute's show last week in Cleveland. Exhibitors and showgoers expressed confidence in business conditions. Any third quarter dip is seen as a time to regroup before the boom continues on into 1957.

Material handling equipment orders booked through the first four months of 1956 were better than 45 per cent of all orders booked last year, reports MHI. First quarter bookings were 35 per cent of 1955's.

Demand, Supply—From the visitors' side of the fence came this comment: "Our plant (in the clothing industry) is both automated and antiquated. We're here to find a conveyor line for new machinery we have ordered."

Visitors agreed they were seeing more new equipment than ever before. But Robert L. Fairbank, Towmotor Corp., and MHI's second vice president, cited his industry's three-year design interval as important for buyers to remember. Equipment makers can't change their production lines as often as auto makers.

Accessories—A spokeman for the Exide Industrial Division, Electric Storage Battery Co., reported industrial battery sales are up almost 10 per cent this year. Said Gould-National Batteries Inc.: "Even Detroit is still buying, and that's the only place we know of that is slack."

The construction boom this year will mean $60 million in business for the Construction Machinery Division, Clark Equipment Co., "if we can turn out the production."

George G. Raymond Jr., Raymond Corp., and MHI's president, summed up his industry's outlook: "We have a tremendous area for improvement, with between 25 and 60 per cent of industry's labor costs involved in handling material."

New Wooden Box Standards Cut Handling Time

The time it takes to unload bulk shipments of bolts, nuts and rivets in cars has been reduced from 16 man-hours to 40 minutes. The trick: A fork lift truck which handles the new boxes in unit loads (16 boxes). The National Wooden Box Association and the Committee on Material Handling, Association of American Railroads, developed the sizes—three were selected to standardize quantities and simplify inventory and invoicing problems

Who Gets Fast Tax Write-Offs?

(Dollar amounts in millions as of Dec. 28, 1955)

MAJOR INDUSTRIES	No. of Certificates Outstanding	Facilities' Cost*	Certified for Fast Write-Off Amount	Certified for Fast Write-Off % of Facilities' Cost
Total—All industries	20,479	$34,081	$19,763	58.0%
Manufacturing industries—Total	13,477	16,487	10,174	61.7
Primary metal industries	1,715	5,654	3,921	69.3
Chemical and allied products	1,060	2,989	1,597	53.4
Products of petroleum and coal	621	2,715	1,658	61.1
Transportation equipment	2,423	1,266	815	64.4
Machinery (except electrical)	3,150	866	515	59.5
Pulp, paper and board mills	117	812	419	51.7
Electrical machinery, equipment and supplies	1,211	550	322	58.6
Ordnance and accessories	1,116	347	229	66.0
Other manufacturing industries	2,064	1,288	697	54.1
Nonmanufacturing industries—Total	7,002	17,594	9,589	54.5
Utilities and sanitary services	920	6,417	2,834	44.2
Railroads	2,114	5,042	3,262	64.7
Mining	609	2,316	1,550	66.9
Pipeline transportation	235	1,263	329	26.0
Water transportation	745	897	533	59.4
Air transportation	43	560	443	79.1
Other nonmanufacturing industries	2,336	1,098	640	58.2

Source: Office of Defense Mobilization
*Estimated total cost of projects as shown on applications

Tax Amortization Under Fire

A VIRTUAL end of the rapid tax amortization program is presaged by a Joint Economic Committee staff report.

Its position: "Continuation of the special amortization program may have significantly adverse effects on the balanced growth of the economy and efficient use of resources."

Influences—Factors pointing to to a new look at the situation are: 1. A sharp rise in granting of certificates of necessity in the first half of 1956. 2. The fact that receivers of certificates may get substantial benefits over others in the same business. 3. Possible revenue losses to the treasury.

In any event, a sharp drop off in new certifications is at hand because the recent flood of them is due mainly to the cleanup of a backlog of pending applications.

Cutback—Now that the backlog has been waded through, most of the goals are closed. Only 30 remain open, compared with 220 in 1953—and most of the open ones are tied in with Defense department and atomic energy requirements, research and development of guided missiles and certain strategic materials.

Adding weight to the picture is Treasury Secretary George Humphrey's stand that fast tax write-offs were a fine thing when a rapid industrial build-up for defense was needed but that they have no place in a peacetime economy.

Some exceptions will probably be made for facilities of direct concern to defense, such as the program to expand nickel production. (For more on nickel, see page 164.)

Questions on Credit

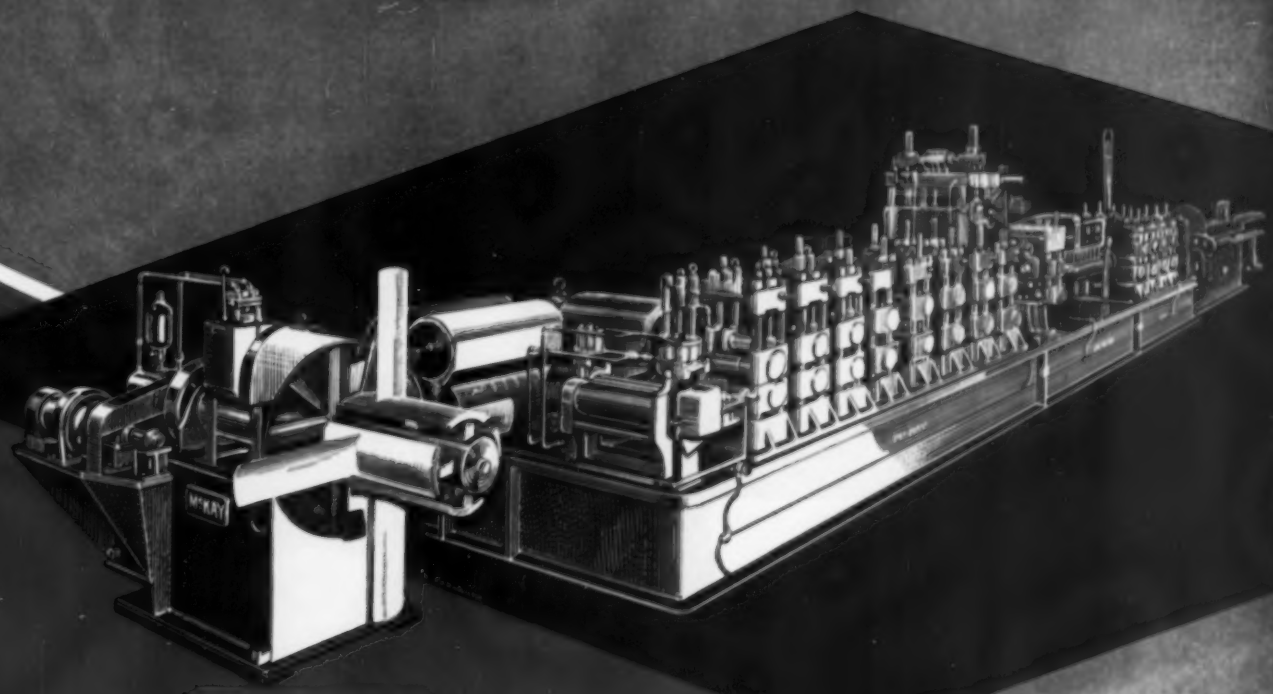
Congress will take a look-see into the Federal Reserve Board's credit control measures. The subcommittee on Economic Stabilization headed by Rep. Wright Patman (Dem., Tex.) will hold a hearing tomorrow.

The aim is to find reasons for differences of opinion on FRB's last discount rate hike.

Certain to be on hand is Treasury Secretary Humphrey, who says he wouldn't have made such a move at that time.

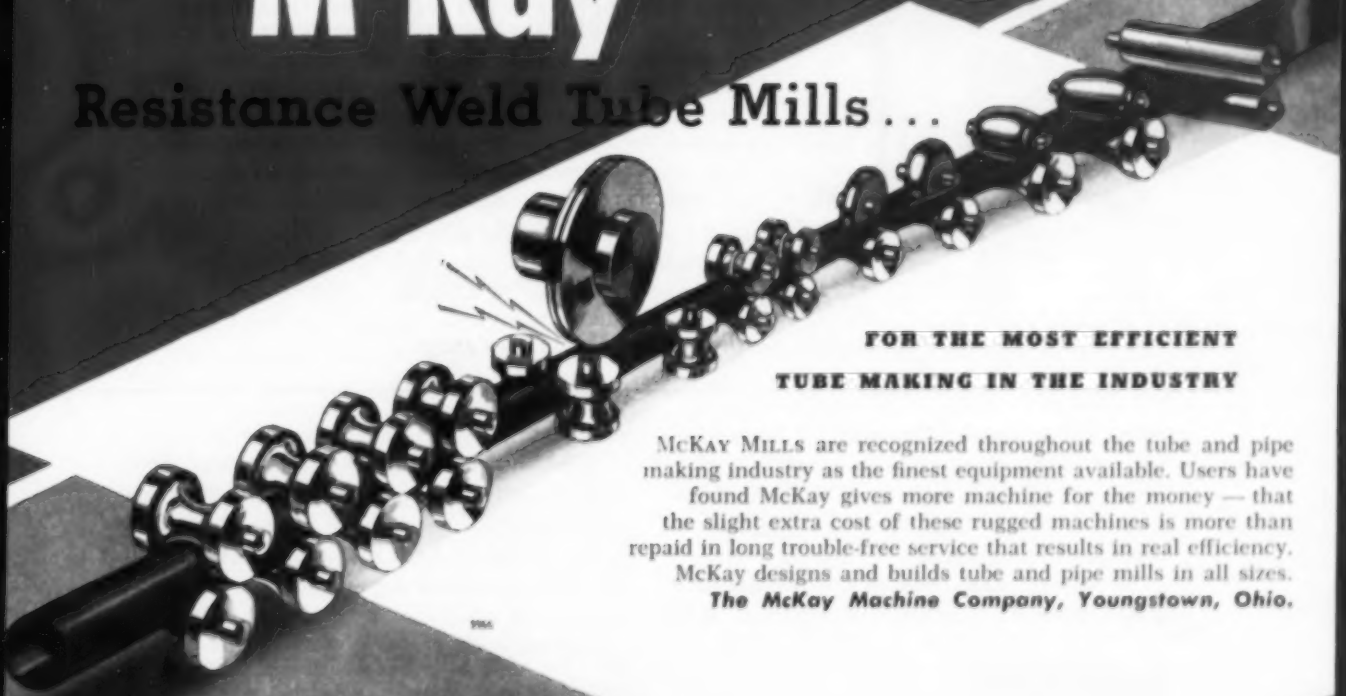
Here and There

- The President has set up a cabinet committee to recommend ways to strengthen the economic position of small business and to foster its sound growth. Arthur F. Burns, chairman of the Council of Economic Advisers, will head the group which already has come under Democratic fire as election year politicking.
- The Senate will try to narrow the application of the House-passed bill requiring companies to give 90-day pre-merger notice. Business transactions not affecting competition will be exempted specifically from the pre-notification requirement if the move succeeds.
- Six makers of rubber V-belts for industry have been charged with price fixing by the Justice department. Named are: B. F. Goodrich Co., Akron; Gates Rubber Co., Denver; Dayton Rubber Mfg. Co., Dayton; Goodyear Tire & Rubber Co., Akron; U. S. Rubber Co., Philadelphia; Boston Woven Hose & Rubber Co., Boston. They deny the charges.



McKay

Resistance Weld Tube Mills . . .



FOR THE MOST EFFICIENT

TUBE MAKING IN THE INDUSTRY

McKay Mills are recognized throughout the tube and pipe making industry as the finest equipment available. Users have found McKay gives more machine for the money — that the slight extra cost of these rugged machines is more than repaid in long trouble-free service that results in real efficiency. McKay designs and builds tube and pipe mills in all sizes.

The McKay Machine Company, Youngstown, Ohio.

McK

SETTING THE STANDARDS OF QUALITY IN METAL WORKING MACHINES FOR TWO GENERATIONS

MOTHER HEN TO 60,000 BABY CHICKS

How Stainless Steel from THE HOUSE OF STAINLESS Helps Build Top Performance into Vapor Watchman Water Heaters

Photos, courtesy Vapor Heating Corporation, Chicago, Illinois, and Frisco Lines.

THE NEED—Transporting 60,000 baby chicks by baggage car in a freight train, and maintaining the 80-degree warmth to which they are accustomed, requires unfailing heating equipment. Vapor Heating engineers found that the material being used for the inner and outer water jackets on their Vapor Watchman car-heating unit was not meeting their high standards of performance in resisting corrosion.

THE ANSWER—After consultation with CSS metallurgists, the manufacturer changed specifications on these vital parts to stainless steel. In so doing, Vapor Heating Corporation not only secured the lasting corrosion-protection required, but also received bonus benefits that are inherent only in stainless steel.

Experiences like this demonstrate the soundness of engineering stainless steel into your product. With the many types to choose from, you can be sure that there is a stainless to meet your exact needs.

No matter which one of the properties of stainless steel you want, you'll get *all* of its other advantages as a bonus.

The House of Stainless is ready to work with you in selecting the proper grade and type and in filling your requirements from our warehouse stocks or from mill shipments through our mill placement department.

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AC's Anderson: Record Maker

"TO BE A STRONG organization you have to have everybody's maximum contribution," says Joseph A. Anderson, general manager, AC Spark Plug Division, General Motors Corp., Flint, Mich., and Milwaukee, Wis.

He feels a company has to get people interested in wanting to contribute, then give them the opportunity to do so.

Mr. Anderson stresses three factors which help create this atmosphere. They are not new to management. They work well at AC because, as one employee puts it: "Joe Anderson believes in them. He makes them work!"

Community—"We urge all of our people to be active in local affairs. Participation in community activities broadens an individual; makes him more useful to himself and his company," says Mr. Anderson.

It isn't a one-way street. The part division often sponsors talent programs and shows to which townspeople are invited. Result: AC has a reputation of being one of the best places to work in Flint.

Confidence—Mr. Anderson believes in management's right to manage. He cites this policy: "We show our people that we'll be fair to them. We also expect them to be fair to us. If you state that, you have to live up to it."

This mutual confidence pays off. AC has lost only one day's work through walkouts in the last ten years. This is an unofficial record in an industry where strikes are part of the game.

Creativity—Mr. Anderson has pushed a creativity program to encourage suggestions from employees. He says: "We want the sum total of everyone's ideas. A suggestion usually reflects something that is wrong."

This creative atmosphere has helped AC top all GM manufacturing divisions in the U. S. in suggestions for three straight years. Last year, employees turned in 23,408 suggestions. A total of 7585 were accepted and earned $179,766 in awards.

Background—Mr. Anderson was born in Ishpeming, Mich., Feb. 26, 1900. He was reared in Minnesota and helped to pay his way through the University of Minnesota by working as a toolmaker.

After graduation in 1924 with a degree in mechanical engineering, he came directly to AC as an inspection foreman. He has been with the company ever since; was named general manager in 1953.

In his spare time, Mr. Anderson sets a good example by taking an active interest in Flint's civic organizations. He has spoken extensively to service clubs on "Understanding of Americanism." In 1955, he was awarded the University of Minnesota's Outstanding Achievement Medal.

Caterpillar Tractor officials offer these—

Tips to Better Apprentice Programs

1. **Determine specific apprentice program objectives. If you're looking for future potential managers as well as skilled tradesmen, apprentice qualifications and training standards should be high**
2. **Promote your program — through area schools, civic groups, business groups**
3. **Don't take on apprentices to act as errand boys—you're paying them to learn**
4. **Make sure apprentice training is well rounded. Apprentices should get the "special" as well as the routine jobs while in training. If they don't handle the tough jobs as apprentices, they won't know how as skilled people later**
5. **In providing instructors, stay within your own organization when possible—apprentice graduates make excellent instructors. Don't tack on an apprentice teaching job to someone already overloaded with responsibilities**
6. **Select instructors for their teaching ability as well as technical know-how. If the instructor can't communicate his knowledge, he's of little value**
7. **Remember you're dealing with a young man's future—don't foul it up. Does he have the desire, aptitude and ability to follow the skill you're placing him in?**

Springboard to Management

Caterpillar Tractor Co.'s apprentice progam has already produced one vp—plus other top executives. Success formula: Top promotion, screening and teaching

APPRENTICE programs can amount to a sizable investment—but the dividends, a pool of skilled workers and potential managers, are worth it.

No Pinch—"That's our philosophy at Caterpillar Tractor Co.," says Clyde L. Schwyhart, manager of education and training. "We've graduated nearly 1200 apprentices since 1930. The two major results:

"1. We've never felt the severe pinch for skilled help that many companies have had during extreme labor shortage periods. 2. It has been an excellent springboard for many to enter supervisory and top management posts—approximately 30 per cent of the graduates have made the jump."

Caterpillar has nearly 360 apprentices in its program. "It's difficult to pinpoint costs of the program," officials relate, "because we have 60 people who are connected with the administration of not only our apprentice programs but our three other training programs as well—a total of better than 760 trainees.

Guidepost—"But as a guidepost in figuring costs, you must consider that you pay the apprentice's salary while he is in the classroom turning out no production; you have to provide adequate facilities in equipment and classrooms; you have to pay instructors. We estimate our costs to be comparable to that of educating a student in high school."

Caterpillar determines the number of apprentices it needs in this manner: Based on experience with retirements, deaths, quits, discharges and transfers, an estimate is made of the number of skilled men needed in each trade annually. This figure is cut in half to arrive at the final number.

New Blood—"We halve our estimated requirements for three reasons," Mr. Schwyhart points out. "It assures us that during depressed times we won't be training apprentices we can't place when they're graduated. It provides an opportunity to upgrade the nonskilled worker. It permits us to bring in skilled men from the outside—putting new blood into your skilled worker organization is just as desirable as it is at the management level."

As important as the apprentice course is the recruitment of candidates. "Before you set your apprentice standards, you should determine your program objective," says Wayne Bogener, an apprentice graduate who now heads the recruitment program. "We expect a substantial number of apprentices to move into supervisory posts, so we keep our standards high."

College Boys—Applicants are screened through personal interviews, educational backgrounds are checked, and a 4-hour battery of tests is given, covering mental alertness, mathematics, mechanical comprehension and visualization, and personal psychological factors.

Nearly a third of Caterpillar's apprentices have some college background.

Apprentice program promotion is one of the keys to successful recruitment of applicants, says Richard Picl, an interviewer and former apprentice. He recommends this co-operation with communities within a 50-mile radius: Participate in high school career days; provide student tours of your plants; conduct community open houses when possible; have your apprentice program officials give frequent talks before student, civic and business groups; highlight apprenticeship completion with graduation dinners or other special ceremonies.

Objectives—The objectives of your apprentice program will also determine what type training you will offer. The Bureau of Apprenticeship of the Department of Labor recommends certain standards, but they are not mandatory. Caterpillar's program was set up not only to provide training to meet the skilled requirements, but to give the individual a good background for moving into supervisory positions.

Most Caterpillar apprenticeships are four-year courses. In addition to complete training on every machine and piece of equipment used in the skill, the apprentice spends 10 per cent of his time in the classroom. Subjects include manufacturing fundamentals, accounting, engineering drawing, economics, mathematics, production planning, English, chemistry, government and psychology, plus subjects related to the particular skill.

Apprentice dropouts are expensive. You can't avoid them entirely, but careful applicant screening and administration will hold them to a minimum. Biggest factors in dropouts in Caterpillar's experience are men being drafted and leaving for higher education. Lack of ability or loss of interest by the apprentice accounts for only a small percentage of the dropouts.

How High?—Apprentices can climb to the top at Caterpillar. Apprentices in top management today include: A vice president, two plant managers, manager of manufacturing—general office, manager of purchases—general office, director of foreign manufacturing, director of domestic manufacturing.

Says Lloyd L. Ely, director of domestic manufacturing: "Caterpillar's apprentice program can be directly credited with building our reputation for quality. The careful training we give our men makes it possible for us to maintain our position of leadership in our industry."

Caterpillar's instructors are chosen for their ability to teach

Executive Pay Rises

Average salary in middle management last year went up 5 per cent to $11,347

MIDDLE management, executives in the stratum between the policy making and general foreman levels, had a good year in '55. Nearly three-fourths got raises.

An American Management Association's survey shows that 35 per cent of the pay hikes were between 5 and 9 per cent and were given for merit. Its survey covered over 20,000 executives in 33 industries.

Bonuses—Middle management is as likely to receive bonuses as top management. Bonuses were given to 47.8 per cent, about the same percentage shown in the association's last survey of top management.

On the average, manufacturing and marketing executives received more and larger bonuses than those in engineering, finance or personnel.

Salaries — In small companies, middle management salaries usually range from $5000 to $14,000 a year. In large companies they may go as high as $30,000. The ceiling, observes the report, seems to be determined by sales and profits; the floor, by legislation and union contracts.

Other factors affecting salary depend on position. For example, the salary of a plant manager tends to be correlated with the production of his plant, while the salary of a labor relations executive is related to the number of union contracts he negotiates.

The size of the raise depends on the reason for it—merit, promotion or general increase.

Turnover — The association found that 7.5 per cent of the executives changed jobs last year. And 2.2 per cent of the positions covered were eliminated.

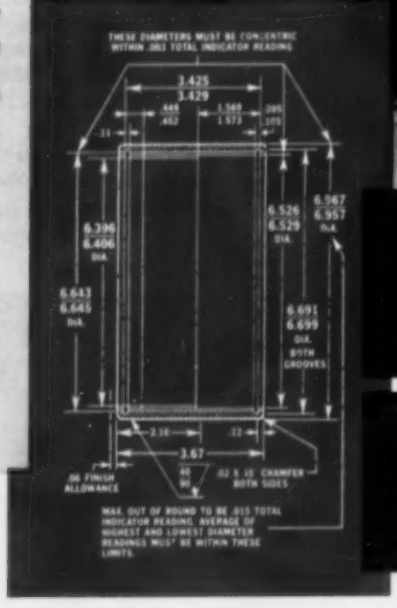
Slightly over half the executives are between 35 and 49, and have been in their present positions less than five years. Their companies, which are scattered throughout the U. S., have employment figures ranging from less than 500 to more than 10,000.

Automobile Manufacturer produces

Repetitive Pieces to Close Tolerances with

BULLARD MULT-AU-MATIC Type "L"

At one of the nation's largest automotive plants, a number of Bullard Mult-Au-Matics, Type "L" are employed to produce automatic transmission parts. According to the Process Engineer "The transmission is the most precision piece of equipment in the entire car — with many moving parts fabricated to close tolerances."



If you have need to manufacture to exacting tolerances it will pay you to investigate the many advantages offered by Bullard Mult-Au-Matic, Type "L".

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General Motors Corp.

Material, skilled labor shortages plague diemakers as . . .

Tooling Deadlines Near

TOOL and die makers say they'll meet most delivery dates for new model tooling if all goes well. Shortages of plate steel, lack of skilled help and usual last minute engineering changes are making it tough.

Bulk of tool and die deliveries will come between mid-July and the end of August. Some started the middle of May. A few will run into September. Here's what Detroit area suppliers agree on:

Materials — "Plate steels are hard to get, but we're not having any trouble with tool steel," reports H. W. Strohben, chief engineer, Jeffery Tool & Engineering Inc. "Foundry pattern castings were tight a few weeks ago, but they're all right now," he adds.

A spokesman for Distel Tool & Machine Co. says: "We ran into difficulty getting plate steel two or three months ago. Delivery dates are between six and eight weeks." Most tool and die outfits buy from warehouses since they don't use enough to warrant mill purchases.

Reason — Companies say plate shortages stem from the fact that local warehouses stocked up on sheet and strip steel in anticipation of high demand by auto makers. It didn't materialize, but construction ate up plate stocks. There's not enough to go around now.

Kasle Steel Corp., Detroit, reports: "The amount of light plate coming in is negligible. It doesn't make a dent on the market. We can't guarantee delivery of heavier plate. There just isn't any."

Zero—Some plate steel is available on the East Coast and in Canada, but few companies can afford to pay 12 to 15 cents a pound for it. Bond Steel & Storage Co., Dearborn, Mich., adds: "Our inventory of plate steel (3/16 to 1-in.) is zero!"

Even the tool and die men who stocked up on plate steels earlier this year are in trouble. Engineering changes from the auto companies have eaten up reserves.

Labor—Auto industry unemployment is higher than it has been in several years. It will continue to increase, but most of the men laid off are production line workers. In spite of this situation, there is a crying need for skilled workers in small shops.

"Right now we could use 20 tool

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and die makers if we could get them," exclaims Brian Leavy, purchasing agent for Bratton Tool & Die Co., Detroit. "Diemakers are in short supply, but it's not too difficult to get fixture builders," adds Leonard Mooi, assistant secretary-treasurer, Garland Mfg. Co., Detroit.

Milling and boring machine operators, vertical and turret lathe men and diemakers, barbers, punch finishers and shaper hands seem to be most in demand. A glance at employment boards shows many companies offering 54-hour weeks for skilled help. The need for pattern makers and die designers is easing off.

Grab Bag—Industry men blame part of the labor tie-up on union rules which don't allow men to work as journeymen diemakers without ten years of experience. There are ways around this, but there isn't much the tool and die people can do when auto companies themselves take some of the best help.

Shop superintendents also report that skilled labor is getting high hat. One foreman says: "Some of these men act like prima donnas. They want to do everything but work!"

Changes—As July and August deadlines approach, jig and fixture builders and body die men worry about slowdowns caused by changes from automobile companies.

Paul Ritchey, sales engineer, Auto-Air Industries, Lansing, Mich., points out most of the revisions are functional, not basic design changes. At this stage, they almost have to be.

So far, most changes have been minor, say diemakers, but they are enough to push back schedules. Builders believe changes are about normal for the major programs under way.

Chrysler spokesmen say: "We expect all our tools and dies for 1957 production to be delivered on schedule. Everything is moving along on or ahead of schedule." Ford Motor Co. reports: "Tooling programs for 1957 are on schedule." General Motors, Studebaker-Packard and American Motors say the same.

Opinions—Tool and die men supplying auto makers tell a slightly different story. From them comes word that Chrysler can't place the second half of its giant tooling program for Imperials and Windsors.

These models are rumored to have some of the biggest changes in store. Tooling people say failure to place the orders may hold up Imperial and Windsor introductions until late October.

Lineup—As it looks now, Ford should have tooling finished on time, probably by the end of August. The Mercury Division seems to be in especially good shape. The Ford Division has had only minor die and tooling changes.

Fisher Body divisions are making GM schedules drag. Body dies are being held up and even returned to builders for fairly big changes. It's rumored that Chevrolet and Pontiac are hardest to please. This might mean these GM lines are in for more of a facelift than has been expected.

Independents—Of all the auto makers, AMC has said the least about tooling. Ramblers, Nash and Hudson cars aren't due for too many drastic changes.

As a result, AMC has been able to stick pretty close to original estimates. Most of its tooling should be ready by August. It might be that the 1957 Rambler will be the first car out. Studebaker-Packard can't afford the major tooling it wanted. Result has been to delay letting contracts for S-P facelifts.

Facilities — Although most tool and die companies are rushed, some will take on more business. The May report from the Automotive Tool & Die Manufacturers' Association shows that small and medium sized jigs, fixtures and most gages (with the exception of build-up fixtures) can be ordered on the basis of one-to-four-week delivery.

Small sheet metal dies also can be obtained within a month from half the companies listed in the association's report. Tight items are heavy forging and large sheet metal dies. Delivery dates on these are over the two-month mark. Most companies making them haven't room for more work anyway.

U. S. Auto Output

Passenger Only

	1956	1955
January	612,079	659,508
February	555,689	674,951
March	575,530	792,436
April	547,766†	752,245
4 Mo. Total	2,291,064†	2,879,140
May		723,868
June		648,412
July		658,696
August		613,705
September		460,443
October		517,788
November		749,061
December		682,256
Total		7,933,369
Week Ended	**1956**	**1955**
May 5	112,730	172,031
May 12	105,654	177,287
May 19	105,869	176,441
May 26	108,230	167,555
June 2	76,934†	125,018
June 9	105,000*	134,673

Source: *Ward's Automotive Reports*
†Preliminary *Estimated by STEEL

Chrysler Consolidates

Chrysler Corp. reports fabrication, assembly and painting of all 1957 Plymouth car bodies will be consolidated in its Mack avenue (Detroit) plant.

Passenger car bodies always have been made at the Mack plant, even when it was owned by Briggs Mfg. Co. Plymouth station wagon and special bodies are built at Chrysler's Meldrum avenue plant, also in Detroit. The move will place all Plymouth body building under one roof.

John Brennan, vice president and group executive of the corporation's newly announced Stamping & General Mfg. Group, says: "This consolidation is part of the intensive corporate-wide program of improving the company's competitive position."

Chrysler asserts positively that the 2000 workers employed at the Meldrum plant will be absorbed in the Mack avenue and other company plants in Detroit. Meldrum facilities probably will be used for storage.

The company plans to install four additional lines of heavy presses with automatic handling devices in the Mack plant to handle the increase in body stamping work.

The Frank G. Hough Co., Libertyville, Ill., manufactures "Payloader" tractor-shovels and towing tractors in three types: front-wheel-drive, rear-wheel-drive and four-wheel-drive.

ARISTOLOY STEELS

"Payloader" Parts Produce Production Profit

...When Made From a COPPERWELD LEADED ALLOY

This complex gear assembly is made in six separate operations, or set-ups, with a tooling sequence of 13 machining operations. When the manufacturer switched from unleaded to Copperweld leaded 8620, the faster feeds and speeds gave them a production increase of better than 25%. For example, the surface feet per minute in a finish bore operation increased from 200 SFM to 300 SFM. In addition, tool life increased 60%. Copperweld Leaded Steel, the steel with "built-in productivity" produced profit in this "Payloader" part.

For further details, write for free booklet, "Lead Treated Steels"

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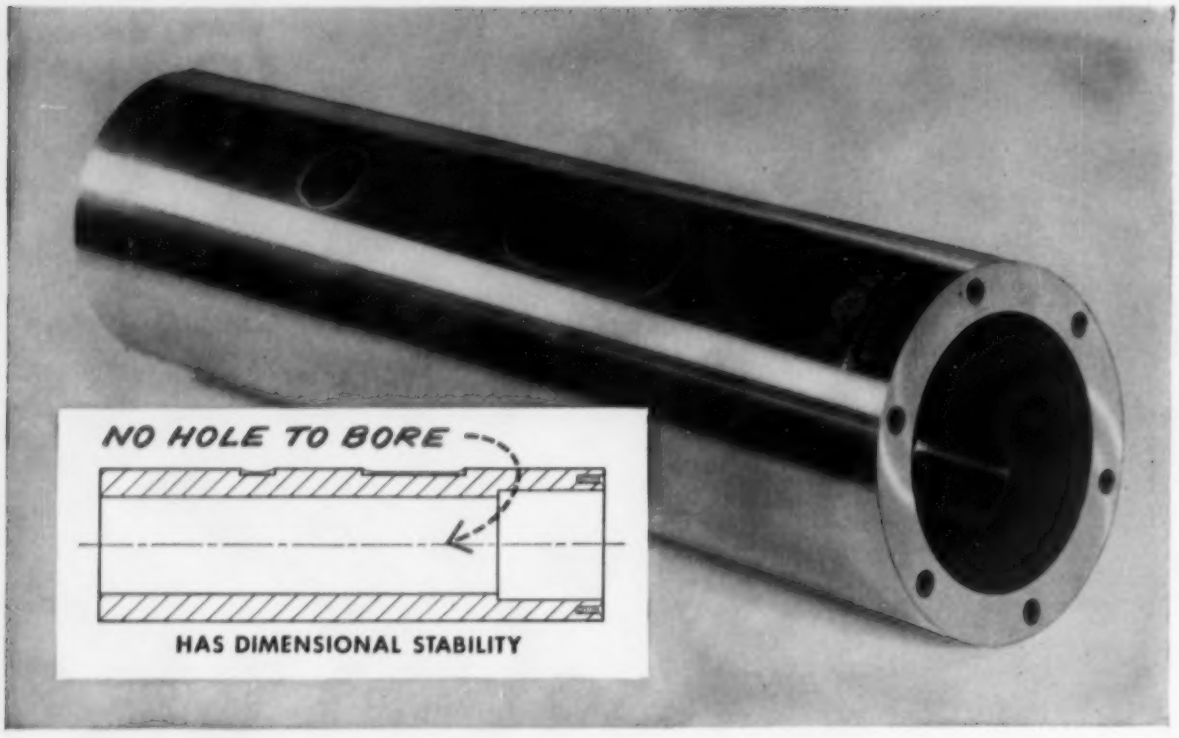


DoALL switches to TIMKEN® seamless steel tubing —cuts spindle housing cost 26%

THE DoALL Company faced a tough problem in reducing production costs of its precision spindle housing, while retaining the required dimensional stability. Timken Company metallurgists came in, worked with DoALL's engineers and recommended a change from the bar stock previsously used to Timken® seamless steel tubing.

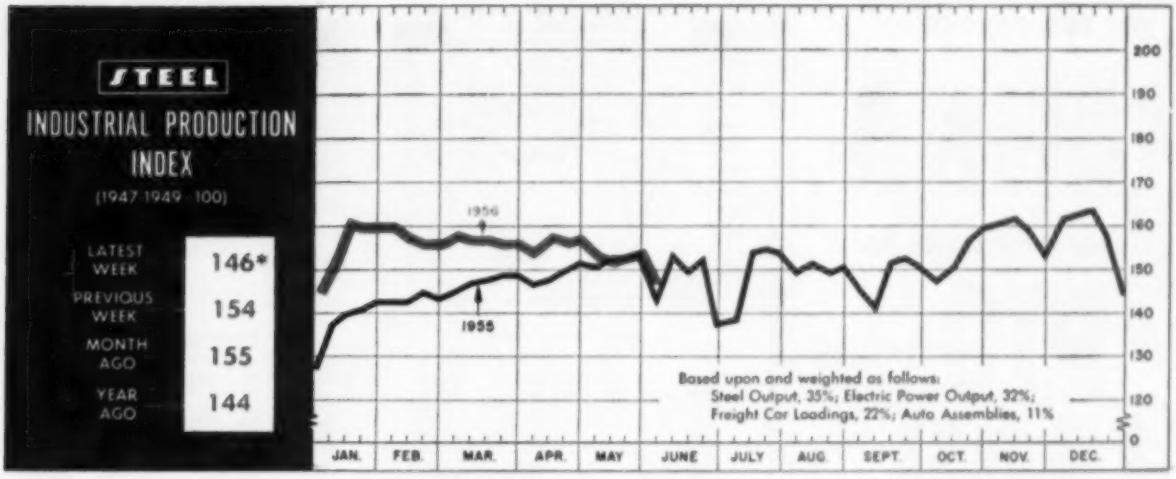
Immediate savings resulted. Machining time was cut. With Timken seamless tubing, the hole was already there. No drilling required. Scrap loss reduced. More parts produced per ton of steel. One of the annealing operations required with bar stock was eliminated.

DoALL and Timken Company metallurgists devisee stress-relieving operations to insure complete stability in the finished part. By changing to Timken seamless steel tubing, DoALL's production cost per housing was cut 26% and thorough lab tests proved there were no dimensional changes in the finished part.

Timken Company metallurgists will gladly work with you on your hollow cylindrical parts jobs, to help you make important production savings with Timken seamless steel tubing. The Timken Roller Bearing Company, Steel and Tube Division, Canton 6, Ohio. Cable address: "TIMROSCO".

YEARS AHEAD—THROUGH EXPERIENCE AND RESEARCH

SPECIALISTS IN FINE ALLOY STEELS, GRAPHITIC TOOL STEELS AND SEAMLESS STEEL TUBING


STEEL
INDUSTRIAL PRODUCTION INDEX
(1947-1949=100)
LATEST WEEK 146*
PREVIOUS WEEK 154
MONTH AGO 155
YEAR AGO 144
1956
1955
Based upon and weighted as follows:
Steel Output, 35%; Electric Power Output, 32%;
Freight Car Loadings, 22%; Auto Assemblies, 11%
JAN. FEB. MAR. APR. MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC.
200 190 180 170 160 150 140 130 120 0

*Week ended June 2

Business Sees Fourth Quarter Pickup

MOST businessmen are looking beyond the expected third quarter dip to the uptrend which they anticipate in the fourth quarter and early 1957. Summer softness is not discounted, but many regard it as a seasonal pattern.

The long-range trend is still up, supported by a growing population that needs—or simply wants—more material things and has the money to buy them. Dips and humps within this trend are inevitable. At present, indications are that the economy is heading into a dip, which most economists feel will not be severe enough to disturb the long-range trend.

Example—Typical is the situation in the appliance industry. After last year's strong rise, it is slowing down a bit—many manufacturers feel it's because they oversold last year and early this year. In this widespread industry, there are crosscurrents, as in the general economy, which tend to cancel each other. Appliances with a high saturation point—refrigerators and ranges, for instance—are feeling the pinch more than those with comparatively low saturation points, such as home laundry equipment. Major appliances, many of which require financing, aren't moving as well as minor appliances which are usually cash purchases.

Home washers and clothes dryers (see charts, page 86) are among the exceptions. While not holding to increases marked up in the first two or three months of this year, their sales through April were still about 11 per cent ahead of those in the corresponding period last year. Factory sales will continue to decline through the summer months until inventories are whittled down to normal, but manufacturers feel that retail sales are holding up well. They expect to be as well off at the end of 1956 as they were last year when a record 5.7 million units were sold.

Level Sales — Manufacturers of ranges expect some pickup in the

BAROMETERS OF BUSINESS

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Production (1000 net tons)[2]	2,373[1]	2,370	2,286
Electric Power Distributed (million kw-hr)	10,800[1]	10,927	9,365
Bituminous Coal Output (1000 tons)	10,115[1]	9,800	9,244
Petroleum Production (daily avg—1000 bbl)	7,000[1]	7,071	6,592
Construction Volume (*ENR*—millions)	$562.6	$310.3	$324.1
Auto, Truck Output, U. S., Canada (*Ward's*)	107,334[1]	138,712	163,731
TRADE			
Freight Car Loadings (1000 cars)	690[1]	788	714
Business Failures (Dun & Bradstreet)	260[1]	273	203
Currency in Circulation (millions)[3]	$30,327	$30,317	$29,961
Dept. Store Sales (changes from year ago)[3]	+3%	+6%	+10%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$18,271	$22,053	$16,738
Federal Gross Debt (billions)	$276.6	$276.3	$277.5
Bond Volume, NYSE (millions)	$15.2	$19.7	$16.5
Stocks Sales, NYSE (thousands of shares)	8,679	11,539	9,711
Loans and Investments (billions)[4]	$85.1	$85.2	$84.3
U. S. Govt. Obligations Held (billions)[4]	$26.9	$27.1	$33.3
PRICES			
STEEL's Finished Steel Price Index[5]	210.45	210.45	194.53
STEEL's Nonferrous Metal Price Index[6]	275.3	276.6	237.1
All Commodities[7]	114.2	114.4	110.2
Commodities Other Than Farm & Foods[7]	121.5	121.7	115.6

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1956, 2,461,893; 1955, 2,413,278. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-1939=100. [6]1936-1939=100. [7]Bureau of Labor Statistics Index, 1947-1949=100

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For 10-lb.-pig users, this new ingot means no free-carbon pockets, finer grain structure, more even melting. Available in all grades, silvery and HannaTite—an extra-close-grain iron.

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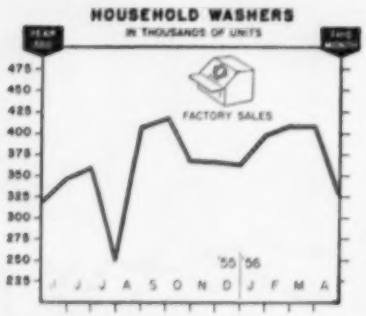
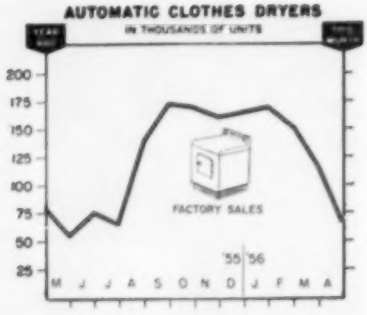
THE BUSINESS TREND





Factory Sales—Units

	1956	1955	1954
Jan.	393,717	357,354	249,956
Feb.	405,631	353,214	295,171
Mar.	405,744	379,555	307,882
Apr.	324,238	313,461	258,712
May	.....	341,759	246,944
June	.....	354,470	303,455
July	.....	245,879	242,863
Aug.	.....	403,770	293,243
Sept.	.....	414,919	379,666
Oct.	.....	362,335	339,169
Nov.	.....	361,341	308,368
Dec.	.....	357,503	264,803
Totals ...	.....	4,236,500	3,490,212

American Home Laundry Mfrs. Assn.

Factory Sales—Units

	1956	1955	1954
Jan.	166,243	115,383	82,195
Feb.	148,522	109,215	82,488
Mar.	113,031	113,496	51,796
Apr.	64,923	73,978	37,661
May	.....	49,228	26,533
June	.....	70,616	39,297
July	.....	60,516	40,755
Aug.	.....	136,190	86,165
Sept.	.....	169,905	107,084
Oct.	.....	166,889	122,182
Nov.	.....	157,153	138,254
Dec.	.....	161,823	115,341
Totals ...	.....	1,384,394	897,751

American Home Laundry Mfrs. Assn.

Charts copyrighted, 1956, STEEL

fall, which will partially offset the sales slump they are experiencing. When the final tally is in at year end, they expect to be off the 1955 pace by only 10 per cent. They are well below that at present. One manufacturer feels sales for the next couple of years will be level until the rise in family formations causes a sharp upturn.

Sales Push — Vacuum cleaners (see chart, page 87) and some other smaller appliances are still on the uptrend. Manufacturers of "sweepers" feel that price and an intensive sales effort are the major factors here. As one industry official told STEEL: "In the '30s, our standard model cost $65. Today, we sell a much better piece of equipment for only $69." Another said: "If other appliance manufacturers would go out and sell as intensively as we have, they would be better off than they are."

Money Is Big Problem

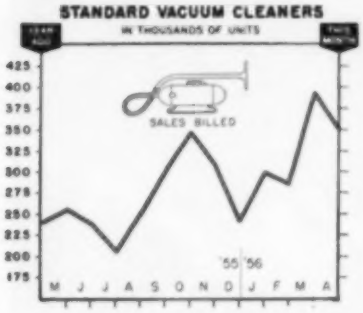
Money—or lack of it—is one of the biggest problems, not only for appliance people, but for most other manufacturers and consumers. Appliance makers will tell you that credit restrictions are hampering their sales efforts. But they feel that the government will not let the situation get out of hand for two reasons: The administration simply is trying to slow down inflationary forces, not stop the boom; it would be political suicide in an election year to let money become too hard to get. The general feeling is that inflation is being checked, and with national conventions drawing close, political pressures will take care of any remaining doubts about what to do. The first easing came last week when the Federal Reserve increased its holdings of 91-day treasury bills by $195 million. This increases the reserves of the nation's banks. Other measures to loosen credit probably will appear before mid-July.

Capital Spending Firm

One of the most salient features of the economy today is the firmness of the capital expenditure program. Cancellations of such important items as machine tools, fabricated structural steel and industrial furnaces have been almost negligible. New orders have been high. The upward trend in orders for industrial supplies (see chart, page 87) has been especially note-

STANDARD VACUUM CLEANERS

IN THOUSANDS OF UNITS

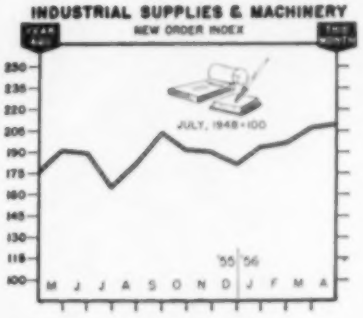


	Sales Billed—Units 1956	1955	1954
Jan.	302,203	248,941	221,233
Feb.	286,386	261,183	199,035
Mar.	395,686	356,444	276,464
Apr.	352,873	241,870	220,849
May	.....	255,941	200,434
June	.....	239,728	195,781
July	.....	206,758	193,607
Aug.	.....	252,691	185,397
Sept.	.....	306,507	238,235
Oct.	.....	349,654	263,197
Nov.	.....	307,287	237,882
Dec.	.....	243,457	217,022
Total	.....	3,270,441	2,658,136

Vacuum Cleaner Mfrs. Assn.

INDUSTRIAL SUPPLIES & MACHINERY

NEW ORDER INDEX



	1956	1955	1954
Jan.	192.7	164.4	139.8
Feb.	195.9	175.1	140.5
Mar.	206.7	186.9	141.5
Apr.	208.6	173.7	131.9
May	.....	191.6	129.4
June	.....	189.1	136.4
July	.....	163.7	119.4
Aug.	.....	181.2	132.5
Sept.	.....	203.2	148.1
Oct.	.....	190.9	136.3
Nov.	.....	189.7	146.2
Dec.	.....	180.6	148.8

Amer. Supply & Machinery Mfrs'. Assn.

worthy. April was the fifth consecutive month to show improvement. It indicates that businessmen are not slowing down their plans to coincide with any temporary lull in the general economy. Aside from the amount of business being done, this is important psychologically. One metalworking executive told STEEL: "As long as businessmen think positively, the uptrend will continue."

Index Takes Holiday

STEEL's industrial production index followed its normal seasonal pattern when it dipped to a preliminary 146 (1947-1949 = 100) for the Memorial Day week of June 2. The decline of 8 percentage points from the previous week compares with a 10 percentage point drop for the corresponding period last year. Output of electrical energy and steel mill operations kept the index from sliding farther because the nation's railroads and the automotive industry observed the holiday. Through the week ended June 2, the index has averaged about 156, compared with an average of 146 for the corresponding period last year. However, it must be remembered that the industrial boom last year was just getting up steam in the first half, while this year the index has been riding along on top of that boom.

Sales, Orders Increase

Durable goods sales, new orders and inventories advanced on a seasonally adjusted basis in April, reports the Commerce department's Office of Business Economics. This maintained the balance that has prevailed for several months. Sales increased to $13.5 billion, nearly recouping the ground lost in March. New orders, at $13.7 billion, were $400 million above those of March, but they were the same amount below February's. Inventories continued the uptrend to $27.7 billion, $200 million above those of March. Unfilled orders remained at $57.2 billion for all manufacturing, but increased to $54.3 billion from the March level of $54.2 billion for durable goods industries.

July 1: The Magic Date?

A business machine salesman told STEEL that July 1 is the date most of his customers have set for reappraisal of their capital expenditure programs. If business prospects look good, they'll open up.

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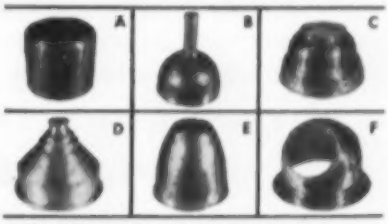
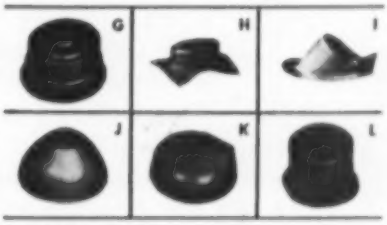


METAL SPINNING AND SPINFORMING:
Typical items: A—Aircraft detail; B—Handle lamp; C—Lamp shade; D—Lamp base; E—Electronic cover; F—Compass cover.



HYDROFORMING:
Typical items: G—Appliance cover; H—Jet engine detail; I—Aircraft detail; J—Jet engine detail; K—Cleaner cover; L—Motor housing.

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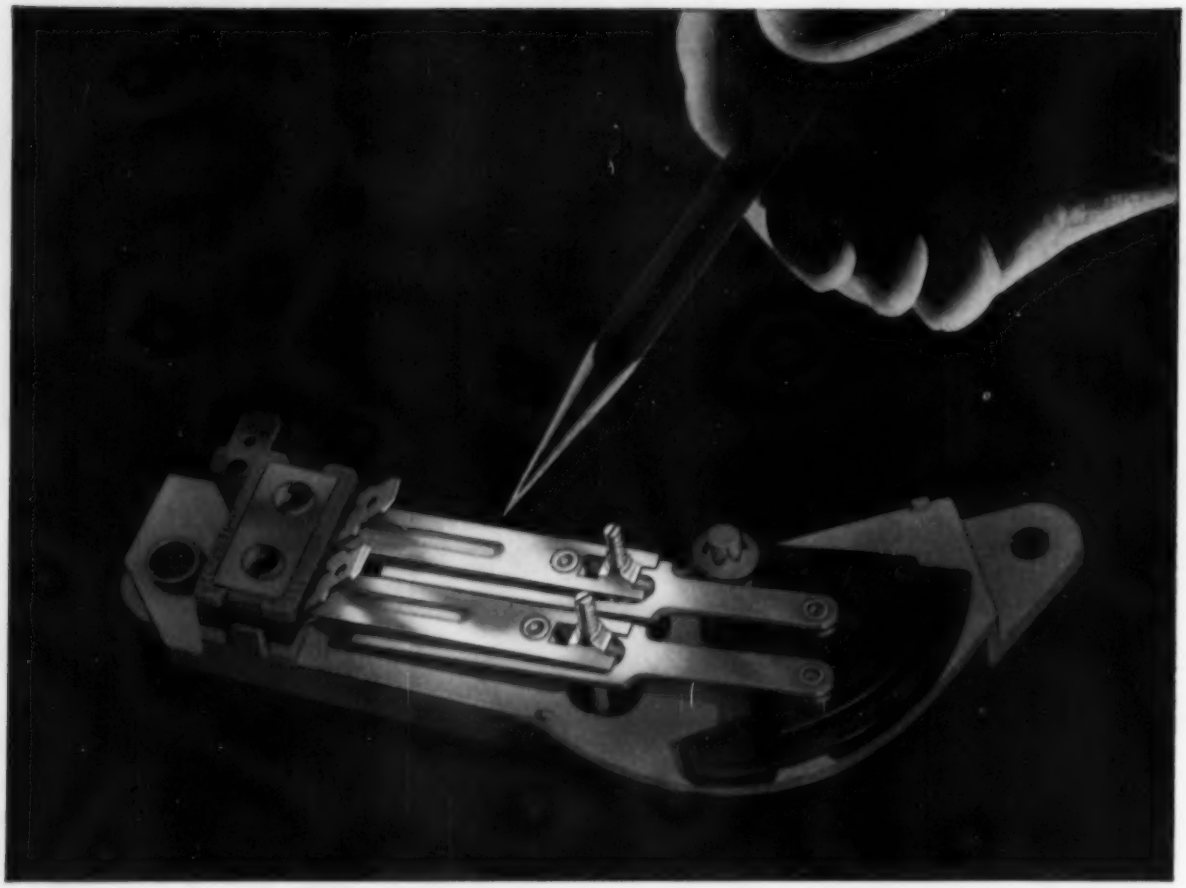

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ONE SPEED CLIP® REPLACES 3 PARTS... SIMPLIFIES ASSEMBLY... and saves money!

General Electric's Housewares & Radio Receiver Division, Bridgeport, Connecticut, adopted this one-piece, multiple purpose SPEED CLIP and made profitable savings in the new G-E Automatic Coffee Maker.

Engineered by Tinnerman specially for the thermostat control, each SPEED CLIP replaces three parts—a blade, a bushing, and a lock nut. Controls are now assembled faster, easier, with improved line flow. There are fewer parts to buy, stock and handle... and unit cost has been reduced, too.

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FASTEST THING IN FASTENINGS®

WALTER R. LOWRY
. . . Beryllium president

Walter R. Lowry was elected president of **Beryllium Corp.**, Reading, Pa. He succeeds **Matthew J. Donachie**, who resigned as president to devote his entire efforts as director of research and development. **Richard M. Quimby** becomes secretary-treasurer.

Bell & Gossett Co., Morton Grove, Ill., elected **R. Edwin Moore** president. He was executive vice president. **Earl J. Gossett**, who was chairman and president, continues as chairman.

Bay State Abrasive Products Co., Westboro, Mass., elected **Earl C. Hughes** executive vice president; **Harold G. Clayton**, vice president-manufacturing; **Elden L. Auker**, vice president-sales; and **Arthur E. Gilman**, treasurer.

Hobart H. Hartong was named chief engineer of the Joliet, Ill., plant of **Phillips Control Corp.**, Thor Corp. subsidiary.

Archie D. Whitlow was made steel co-ordinator for **Delta Tank Mfg. Co. Inc.**, Baton Rouge, La., subsidiary of General Gas Corp.

Acheson Colloids Co., Port Huron, Mich., appointed **Theron T. Chapel** product control supervisor and **James S. Crowl**, supervisor of process research. Mr. Crowl replaces **Erwin J. Campbell**, now product development supervisor.

CLYDE E. WEED
. . . Anaconda president

Clyde E. Weed, vice president-operations, **Anaconda Co.**, New York, will become president July 1 when **Robert E. Dwyer** retires from that position. **Thomas A. Campbell** was elected vice president and **W. Kenneth Daly**, vice president and comptroller. **Elbert O. Sowerwine**, a vice president, has retired.

Pullman-Standard Car Mfg. Co., Chicago, elected as vice presidents **Clyde B. Faverty**, manufacturing; **J. A. Kummerer**, purchasing; and **Robert C. Smith**, industrial relations.

A. S. Chivers was made general manager, western division, **Barry Controls Inc.** He heads the new Barry plant at Burbank, Calif.

George F. Master was appointed chief engineer of **Allen-Bradley Canada Ltd.**, Galt, Ont.

Fred A. Burley was made supervisor of purchasing for **Easy Washing Machine Division**, Murray Corp. of America, Syracuse, N. Y.

Leo S. Ohman was made plant manager at the mechanical division of **General Mills Inc.**, Minneapolis. He was works manager at Scott-Atwater Mfg. Co.

Ernest G. Enck was named director of planning and **William M. Raynor**, director of purchases, **Foote Mineral Co.**, Philadelphia.

GORDON W. SMITHSON
. . . Potter & Johnston v. p.-chief eng.

Gordon W. Smithson was named vice president and chief engineer of **Potter & Johnston Co.**, Pawtucket, R. I., subsidiary, Pratt & Whitney Co. He was chief engineer.

R. I. Cratch was appointed sales manager of **Hoskins Mfg. Co.**, Detroit.

D. S. McCleary, Pittsburgh district purchasing agent, Continental Foundry & Machine Division, was promoted to assistant director of purchases for **Blaw-Knox Co.**, Pittsburgh, parent firm. **Harold F. Fiegenschuh**, purchasing director for the division, has retired. Promoted to staff purchasing agents are **Wayne Rawley Jr.**, **H. P. Bork** and **B. R. Lauer**, who will have headquarters at the company's new offices in the Blaw-Knox building at 300 Sixth Ave., Pittsburgh.

Glenn E. Seidel fills the new post of vice president-engineering for **Minneapolis-Honeywell Regulator Co.**, Minneapolis.

Lester K. Fero was made assistant chief of preliminary design by **Bell Aircraft Corp.**, Buffalo.

William F. Johnson was named director of sales for **Consolidated Electrodynamics Corp.**, Pasadena, Calif.

Alfred B. Rossip was made staff engineer and assistant to the pres-

R. A. MILLERMASTER

W. F. LENT

. . . Cutler-Hammer vice presidents

ident of **General Transistor Corp.**, Richmond Hill, N. Y.

Cutler-Hammer Inc., Milwaukee, elected **R. A. Millermaster** vice president-development and **W. F. Lent**, vice president-manufacturing.

John J. Anderson was made manager of **Westinghouse Electric Corp.'s** major appliance division, Mansfield, O., and **S. J. Stephenson** manager, portable appliance division.

Paul M. Thomas of Dallas was promoted to midwestern regional manager for **Chase Brass & Copper Co.**, subsidiary of Kennecott Copper Corp. Formerly Dallas district manager, he is succeeded by **Alfred M. Johnson.** Mr. Thomas succeeds **G. Townsend Underhill**, resigned.

Charles W. Edmondson was named sales manager-eastern district by **Shakeproof Division**, Illinois Tool Works, at New York. He succeeds **Wesley R. Johnson**, recently elected managing director of Illinois Tool-Shakeproof Ltd., London, England.

Arthur E. Franks was made manager of operations, **Vacuum Metals Corp.**, Syracuse, N. Y. He is succeeded as superintendent of melting by **Christopher S. Houghton**, formerly operating practices engineer.

William N. Matheson Jr. was named vice president-operations, **Oliver Iron Mining Division**, U. S. Steel Corp., Duluth. He has been actively engaged as an operator and supervisor in charge of the Oliver operations for the last 23 years.

George J. Carvalho, former manufacturing superintendent of Universal Winding Co., was made general manager, **Jarvis Power Tools Inc.**, Middletown, Conn.

Fafnir Bearing Co., New Britain, Conn., appointed **Francis G. Patterson** assistant chief engineer-research and **A. Burton Jones Jr.**, assistant chief engineer-special projects.

Cincinnati Lathe & Tool Co., Cincinnati, elected **David A. Wallace** vice president-sales and **E. L. Ritter**, vice president-engineering.

H. K. Porter Company Inc. named **A. A. Lodigensky** director-exports. He has headquarters in New York.

Byron J. O'Hare was elected vice president and active head of **Buffalo Fire Appliance Corp.**, Dayton, O. He was manager of the New York branch and warehouse.

J. R. Walchli was made product manager, southeastern regional office, for **Autronic Process Controls Division**, Swartwout Co. He has headquarters at Decatur, Ga.

Robert S. Grimmett was named Houston district sales manager for Rockwell Mfg. Co.'s **Delta Power Tool Division.** He succeeds **Warren Sherman** who moved to Atlanta as southern regional manager earlier this year.

C. B. Hoffman, sales manager, **J. M. Lehmann Co. Inc.**, Lyndhurst, N. J., was elected vice president-sales.

Gordon Kiddoo, vice president of National Research Corp., Cambridge, Mass., was elected vice president and general manager of **NRC Metals Corp.**, subsidiary.

Edward Willette was appointed sales manager by **Animation Equipment Corp.**, New Rochelle, N. Y.

William E. Sauter was appointed

DAVID A. WALLACE

E. L. RITTER

. . . vice presidents of Cincinnati Lathe & Tool

SPACE A PROBLEM?

Doesn't Have To Be... With

Power Spray Washers

Designed and Built for the Job

by Peters-Dalton

P-D TWO STAGE STEAM HEATED HELICAL DRUM WASHER WITH HEATED BLOW-OFF

The solution tank capacity is 300 gallons; tank temperature is maintained at 190 F., and the heated blow-off, 200 F. Up to 50 cubic feet of small miscellaneous steel parts are washed clean per hour.

P-D GAS FIRED SINGLE STAGE WASHER

Solution tank capacity is 900 gallons; tank temperature is 180 F., heated rinse of 160 to 180 F., room temperature blow-off. This unit is designed to handle miscellaneous machined castings up to 35 lbs. in weight at a rate of 5000 lbs. per hour.

In many cases, plant engineers are faced with serious limitations of available space for the installation of needed additional equipment. Meeting conditions such as these are not the least unusual to Peters-Dalton engineers. The right type washer CAN be designed, fabricated, and INSTALLED by P-D when a layout of plant facilities is given, along with the specifications for the type washer wanted.

The two installations shown here typify P-D efficiency. In the picture at the left the "miser"-like use of space can be readily seen. Here, parts via monorail are brought to and through the washer which is located in a "dead-end" corner of the plant. In the other illustration to the right, the P-D Washer is positioned in an area where it is most accessible for required cleaning operations and for its cycle of productivity.

We'll be glad to tell you more — just write, wire or phone.

Representatives in principal cities.

- *Hydro-Whirl Paint Spray Booths*
- *Industrial Washing Equipment*
- *Drying and Baking Ovens*
- *Hydro-Whirl Dust Collecting Systems*

PD Peters-Dalton INC.

assistant to the president of **C. I. Hayes Inc.**, Cranston, R. I.

Atlas Valve Co., Newark, N. J., promoted **Robert B. Davis** from purchasing agent to sales manager; and **Joseph E. Fachet** from sales service engineer to director of sales.

Alton K. Marsters was elected vice president-sales at **Bausch & Lomb Optical Co.**, Rochester, N. Y. He was administrative assistant to the president.

Bryant Electric Co., Bridgeport, Conn., subsidiary of Westinghouse Electric Corp., appointed **Clyde W. Foster** sales manager, wiring devices; **Ronald W. Essig**, sales manager, appliance controls; and **R. D. Howells** manager, marketing services. **Charles J. Smith** was named manager of manufacturing for the plastics division and **Jack K. Adams**, manager of manufacturing for the wiring device and appliance controls division.

James Gillis was made manager of a new branch office of **Ohio Knife Co.**, opened at 1750 North Highland Ave., Pittsburgh. **Arthur Doud Jr.** was made assistant manager.

James F. Miller joined **Titanium Metals Corp. of America**, New York. His duties involve production of titanium mill shapes from ingots produced at the Henderson, Nev., plant. Mr. Miller was formerly manager of operations, production department, Brackenridge Works, Allegheny Ludlum Steel Corp.

D. W. Lloyd was appointed assistant to the Chicago district manager of **Youngstown Sheet & Tube Co.** He was general superintendent of the steel plant at Indiana Harbor Works.

DONALD F. BROOKLAND

W. T. McGINNIS

. . . Keokuk Electro-Metals executive posts

Keokuk Electro-Metals Co., Keokuk, Iowa, elected **Donald F. Brookland** vice president-operations and **W. T. McGinnis**, vice president, assistant to president.

Onsrud Machine Works Inc., Niles, Ill., elected **Albert L. Breuer** vice president in charge of machine tools sales; **Robert M. Miller**, vice president in charge of woodworking machinery sales; **Earl Pankonin**, vice president in charge of engineering; and **John F. Andrews**, comptroller. **G. M. Campbell** was advanced from vice president and secretary to executive vice president. **John M. Wilken** was made secretary.

William E. Rudel was named to the new post of executive vice president, **Rudel Machinery Co. Inc.**, New York.

W. F. Driver was made manager, industrial products sales, **Vickers Inc.**, Detroit. He was Seattle district manager. **Everett O. Clark** was named manager of a recently opened midwest branch, expanded to include Missouri, Nebraska, Minnesota, the Dakotas and southern Illinois in addition to established territories in Wisconsin, northern Illinois and northwestern Indiana.

James Mason succeeds **E. A. Heidlinger**, retired, as Detroit district manager, **Leland-Gifford Co.** Mr. Mason was formerly with Fellows Gear Shaper Co.

Jack F. Major was named superintendent of **Youngstown Sheet & Tube Co.'s** Campbell Works coke plant, Youngstown. He succeeds **C. A. Covington**, retired.

Leonard J. Spivak was appointed superintendent of **Republic Steel Corp.'s** roll shop at Gadsden, Ala. He succeeds **A. E. Pratt**, retired.

L. W. Elliott was made sales manager, **Griffin Mfg. Co.**, Erie, Pa.

Charles A. Gomer was appointed Baltimore district sales manager by **Inland Steel Products Co.**

OBITUARIES . . .

Elmer F. Miller, 58, sales manager, **Advance Tool & Die Casting Co.**, Milwaukee, died May 9.

Bernard F. Devine, 62, a vice president of **Chain Belt Co.**, Milwaukee, died May 12.

Frederick J. Heaslip, 68, retired vice president, **Fairbanks, Morse & Co.**, Chicago, died May 28.

George R. Murdock, 64, general sales manager, **H. L. Judd Division**, Stanley Works, New Britain, Conn., died May 18.

George E. Hallenbeck, 78, retired chairman, **Baker Bros. Inc.**, Toledo, O., died May 27.

Raymond J. Hurley, 61, retired chairman, **Thor Corp.**, Chicago, died May 28.

Ralph J. Dugger, 72, retired chairman, **Marsten Production Co.**, San Diego, Calif., died May 23.

James B. Holtson, owner and operator of **Holtson Machinery Co.**, Dayton, O., died May 18.

TWO GREAT NAMES

Teamed For Quality...Service...Progress

Two steelmakers, each known for its achievements in its own particular field of producing forged and annular rolled products are now combined to supply requirements of the largest and smallest. Two groups of production and research engineers are joined to better serve American industry. The new company is a totally owned subsidiary of Heppenstall and will operate independently. Each company will continue to offer American industry the custom made products for which it is famous.

MIDVALE - HEPPENSTALL CO.

NICETOWN
PHILADELPHIA 40, PA.

A SUBSIDIARY OF HEPPENSTALL COMPANY

Ordinary hose, with rubber-composition liner, soon deteriorates from active solvents present in all paint materials.

DeVilbiss synthetic-compound liner lasts indefinitely, because it is specially formulated to withstand all solvents.

DeVilbiss-made paint hose resists solvent action longer

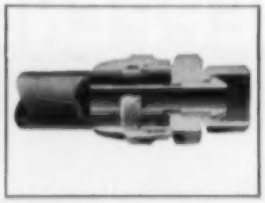
"Torture" tests, the most conclusive known for solvent-hose analysis, prove the superiority of DeVilbiss hose.

Fluid liners from DeVilbiss and other brands of paint hose, when exposed to the prolonged solvent action of common paint thinners, tell the story. The DeVilbiss liner shows no sign of deterioration, while others show marked changes from the effects of turpentine, acetones, ketones, acetates, toluol and other hydro-carbons – proof that DeVilbiss hose outlasts other makes in operations where paints are conveyed.

This laboratory evidence is your assurance of longer protection against hose-liner disintegration, swelling, and plugging – against paint contamination and discoloration!

Next time you order, specify DeVilbiss-made hose. Not only does it resist solvent action better, but also it is manufactured to closer dimensional tolerances . . . and is produced in a specialized DeVilbiss Rubber Plant, where the requirements of quality hose for spray painting have been a scientific study for over 40 years.

DeVilbiss' new oil-resistant air hose is specially compounded for long-lasting service with air tools that require lubrication through the air stream.



DeVilbiss hose connections fit all common sizes of all types of air and fluid hose; provide a smooth, tight-grip, leakproof connection; are reusable.

THE DEVILBISS COMPANY

Toledo, Ohio

Santa Clara, Calif. • Barrie, Ontario • London, England;
Branch Offices in Principal Cities

FOR BETTER SERVICE, BUY

DEVILBISS

Porter Combines Tool Steel Divisions

H. K. PORTER Company Inc.'s Vulcan Crucible Steel Division, Aliquippa, Pa., will be the exclusive producer and seller of tool steels within the Porter organization. Tool steel operations of the firm's Henry Disston Division, Philadelphia, have been transferred to Vulcan.

Distribution Setup — Steel Distributors Inc., Philadelphia, formerly distributor for the Henry Disston Division, is now the distributor of Vulcan tool steel in eastern Pennsylvania, southern New Jersey and Delaware.

Fred Cooper, Vulcan metallurgical engineer, has been assigned as mill representative to work directly with Steel Distributors Inc. and to assist that organization in the application and service of Vulcan tool steels.

Vulcan has appointed Bridgeport Steel Co., Milford, Conn., as its distributor in that state. S. M. Bennett has been assigned mill representative to assist Bridgeport's sales staff and to supplement the services of its tool steel specialist.

Other divisions of the company are: Alloy Metal Wire, Connors Steel, Delta-Star Electric, Eseco, Laclede-Christy, Leschen Wire Rope, McLain Fire Brick, Quaker Rubber, Quaker Pioneer Rubber, Riverside Metal and W-S Fittings.

Fastener Maker Adds to Plant

Abbott Screw & Bolt Co., Chicago, acquired additional space at 1613 W. Walnut St., increasing its area for manufacturing activities to over 40,000 sq ft. The firm makes all types of fasteners and operates a screw machine production service division and a metal stamping and fabricating division.

Wheeling Orders Furnace

Lee Wilson Engineering Co. Inc., Cleveland, will design and furnish a $700,000, single-stack annealing furnace installation at Wheeling Steel Corp.'s mill, Yorkville, O. This project includes construction of 17 single stack furnaces and 50 bases. The furnaces will be used exclusively for the production of tin plate coils. They are designed for coils 72 in. in diame-

(*Please turn to page* 98)

Railroads Add Metal Tie Spacer to Track Supply List

Wrought iron tie spacers (outside the rails on the left track above) are replacing creosoted timbers (parallel to the right track) on many major railroads. The bars measure 20 ft x 3 in. x ⅝-in. and weigh 125 lb. They have high resistance to corrosive attack, are effective in absorbing shock and vibration, permit an increase in speed, ease and accuracy of installation. They eliminate a bridge deck fire hazard, claims A. M. Byers Co., Pittsburgh, the producer

LOOK TO DEVILBISS

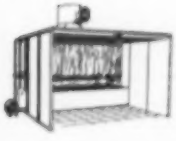
for all your spray equipment needs!

DeVilbiss offers the industry's most complete line of spray equipment – spray guns, spray booths, air compressors, hose and connections – for cold or hot-spray applications . . . manual, semi-automatic, or fully automatic operations.

At your service are a free training school for your operators and supervisors, and a complete research laboratory to analyze your particular coating problems. Call our nearest representative now!

DeVilbiss spray guns are lightweight, comfortably balanced. High-speed, large-capacity types, or small precision models.

DeVilbiss air compressors deliver up to 22.6% more air per dollar than most others. Stationary and portable models. ¼ thru 15 h.p.



DeVilbiss spray booths come in a complete range of types, sizes. Standard, fireproof, reinforced steel panels.

THE DEVILBISS COMPANY
Toledo 1, Ohio

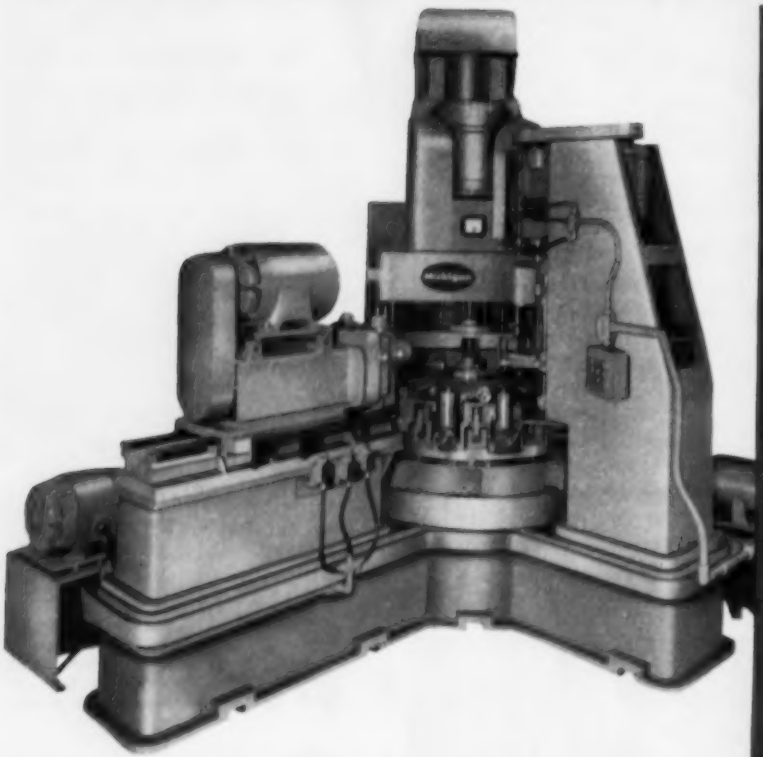
Santa Clara, Calif. • Barrie, Ontario
London, England

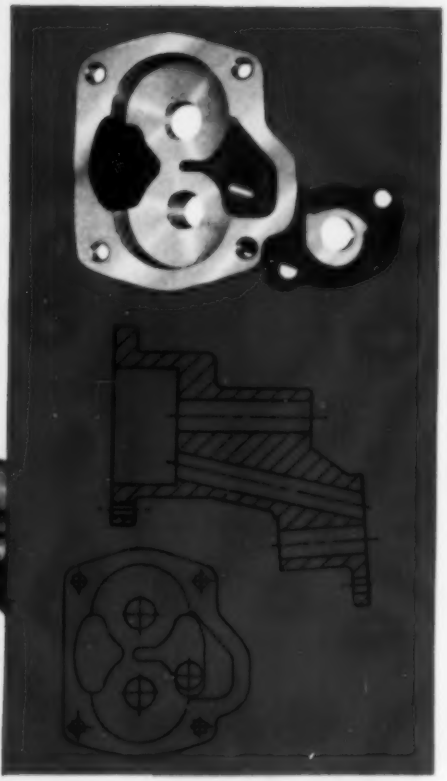
Branch Offices in Principal Cities

FOR BETTER SERVICE, BUY DEVILBISS

Here's a Production Team

120 OIL PUMP BODIES



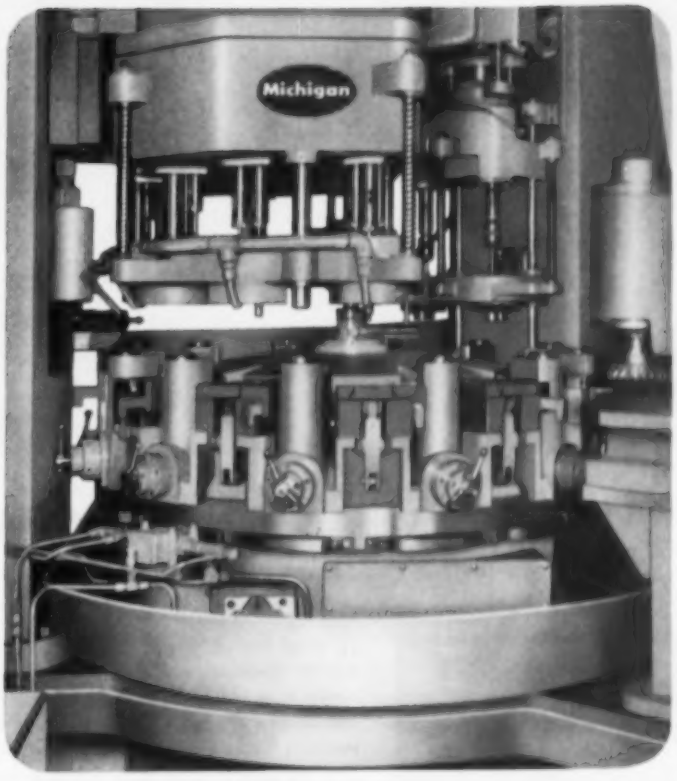


AUTOMATED OPERATIONS ON MACHINE NO. 1		
1. Rough mill the top face.	5. Chamfer the .4845 hole; Chamfer the first (2) mounting holes; and, rough bore one gear pocket.	8. **Finish bore** and square bottom other gear pocket.
2. **Finish mill** the top face.		9. Tap all (4) mounting holes in top face.
3. Drill thru the .4845 hole; and, tap drill (2) mounting holes.	6. Chamfer the .4785 hole; Chamfer the other (2) mounting holes; and rough bore the other gear pocket.	10. **Finish ream** the .4845 hole.
4. Drill thru the .4785 hole; and, tap drill (2) mounting holes.	7. **Finish bore** and square bottom of one gear pocket.	11. **Finish ream** the .4785 hole.
		Ready for Second Machine

For Faster, More Economical Production

That Will Slash Your Costs!

Completely Finished EVERY HOUR



AUTOMATED OPERATIONS ON MACHINE NO. 2

1. Straddle mill the outside lower face; and, inside lower face.	**4.** Drill the 15/32 hole thru.	**7.** Drill the 7/16 hole thru.
2. Finish mill the outside lower face.	**5.** Finish ream the (2) .2491 mounting holes.	Completely Finished.
3. Drill (2) .2491 Mounting holes.	**6.** Drill the 7/16 hole halfway thru.	Ready for Assembly.

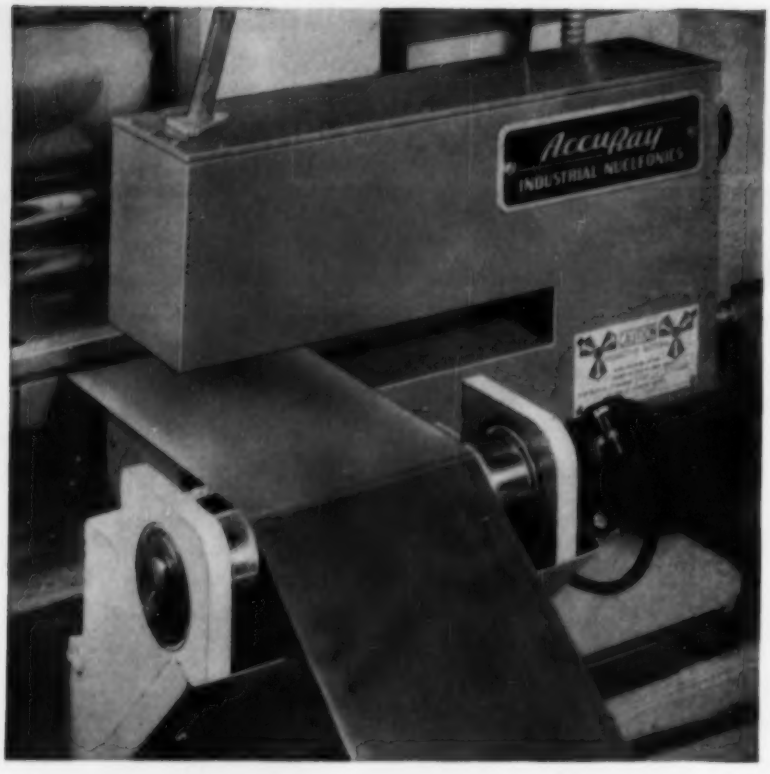
AND THEY'RE FINISHED READY FOR THE PRODUCTION LINE

Michigan

We invite your inquiries regarding our full line of tapping units, and index tables, manual and automatic. Write for Catalog and Engineering Data Sheets.

DRILL HEAD CO. Detroit 34, Michigan

engineers and manufacturers of production machines and drilling equipment



UNIFORM AS THE ATOM

Somers Thin Strip now Gauged by Nuclear Energy

Actual recording of clad steel being rolled to .0065" within a tolerance of ± .0002", virtually all the metal is within ± .0001" (between the heavy vertical lines).

To meet the increasing demands of electronics and other industries for *uniform* closer tolerances, Somers Brass has taken advantage of one of the latest developments in the electronic field by installing the first Accu-Ray gauges in the non-ferrous industry. These units make it possible to check and control thickness from edge to edge throughout each coil to a degree of accuracy never before known.

Accu-Ray gauging is typical of the modern methods Somers combines with engineering experience to provide thin strip metal to your most rigid specifications. Nickel, Monel, and Nickel Alloys from .020" to .00075". Brass, Bronze, Copper and Alloys from .010" to .00075".

For Exacting Standards only

Somers THIN STRIP

SOMERS BRASS COMPANY, INC., 104 BALDWIN AVE., WATERBURY, CONNECTICUT

(*Concluded from page 95*)

ter (maximum) and a piling height of 156 in.

Lewyt Installs Huge Oven

Lewyt Corp., Brooklyn, N. Y., is installing a $110,000 oven at its new manufacturing plant in Long Island City, N. Y. Built by Burdette Mfg. Co., Chicago, it is 52 ft wide, 37 ft long and 20 ft high.

Aluminum Extruder Renamed

Trimedge Inc., Youngstown, has been reorganized under the name of Empire Aluminum Co., producer of aluminum extrusions. The firm plans to triple its productive capacity. Officers are: M. H. Itts, chairman; Paul Horsch, president and general manager; H. L. Berman, vice president and assistant general manager.

Kennecott Titanium Corp.

Kennecott Copper Corp., New York, organized a subsidiary, Kennecott Titanium Corp. The new firm may erect a plant along the Niagara river near Buffalo.

Enlarges Stamping Plant

American Radiator & Standard Sanitary Corp., Pittsburgh, is spending about $300,000 to expand manufacturing and steel storage space and to purchase equipment for its stamping plant at 1803 Elmwood Ave., Buffalo.

Warehouse Changes Name

Reliance Steel Co., Los Angeles distributor of steel, aluminum and magnesium, changed its name to Reliance Steel & Aluminum Co. The firm's Magnesium Division will operate as Reliance Magnesium Co.

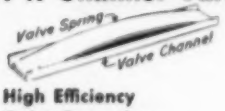
Molding Firm Changes Hands

Youngstown Mfg. Inc., Youngstown, purchased Ford Moulding Co. The property includes a 45,000-sq-ft manufacturing plant at Louisburg, N. C., and the general sales office and a 10,000-sq-ft warehouse at Kearny, N. J. The Louisburg plant includes extrusion presses, heat treating and smelting

A SPACE-SAVING, READY-TO-GO

125 hp TWO-STAGE AIR-COOLED MOTORCOMPRESSOR

- Easy to install
- No water jackets or piping
- No freezing problem
- Air cooled intercooler
- Constant speed or dual control
- I-R Channel Valves

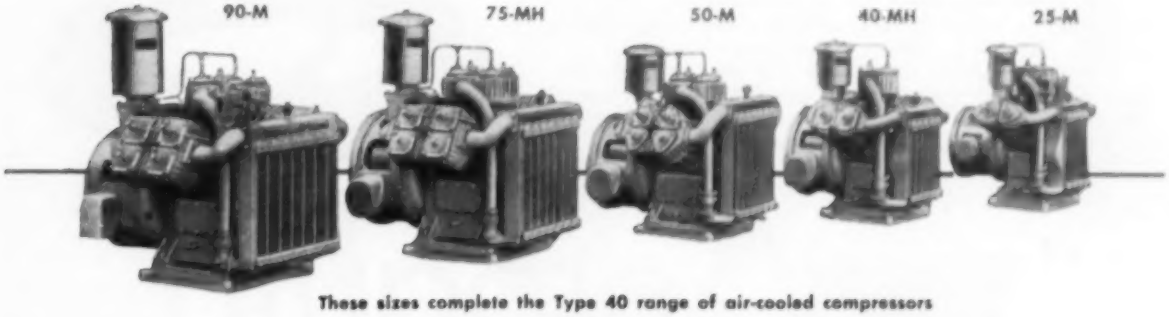


High Efficiency
Quiet Operating
Exceptional Durability
Entirely Different
Stainless-steel Channels and Springs
Air-cushioned action
Found only on I-R compressors

Newest addition to the Ingersoll-Rand line of Type 40 compressors, this heavy-duty, air-cooled unit offers new convenience and economy for the generation of 80-125 psi air power in the 125 hp class. Shipped fully assembled, its compact, well-balanced design and small foundation requirements cut installation costs. And efficient two-stage compression with intercooling to near ambient temperature, reduces power costs all year around.

Choice of constant-speed control, automatic start-and-stop control and manual or automatic dual control affords the most efficient capacity regulation for your particular operating requirements.

For complete information on all the time-saving, cost-saving features of this 125-hp Motorcompressor, send today for your copy of Bulletin 3188.

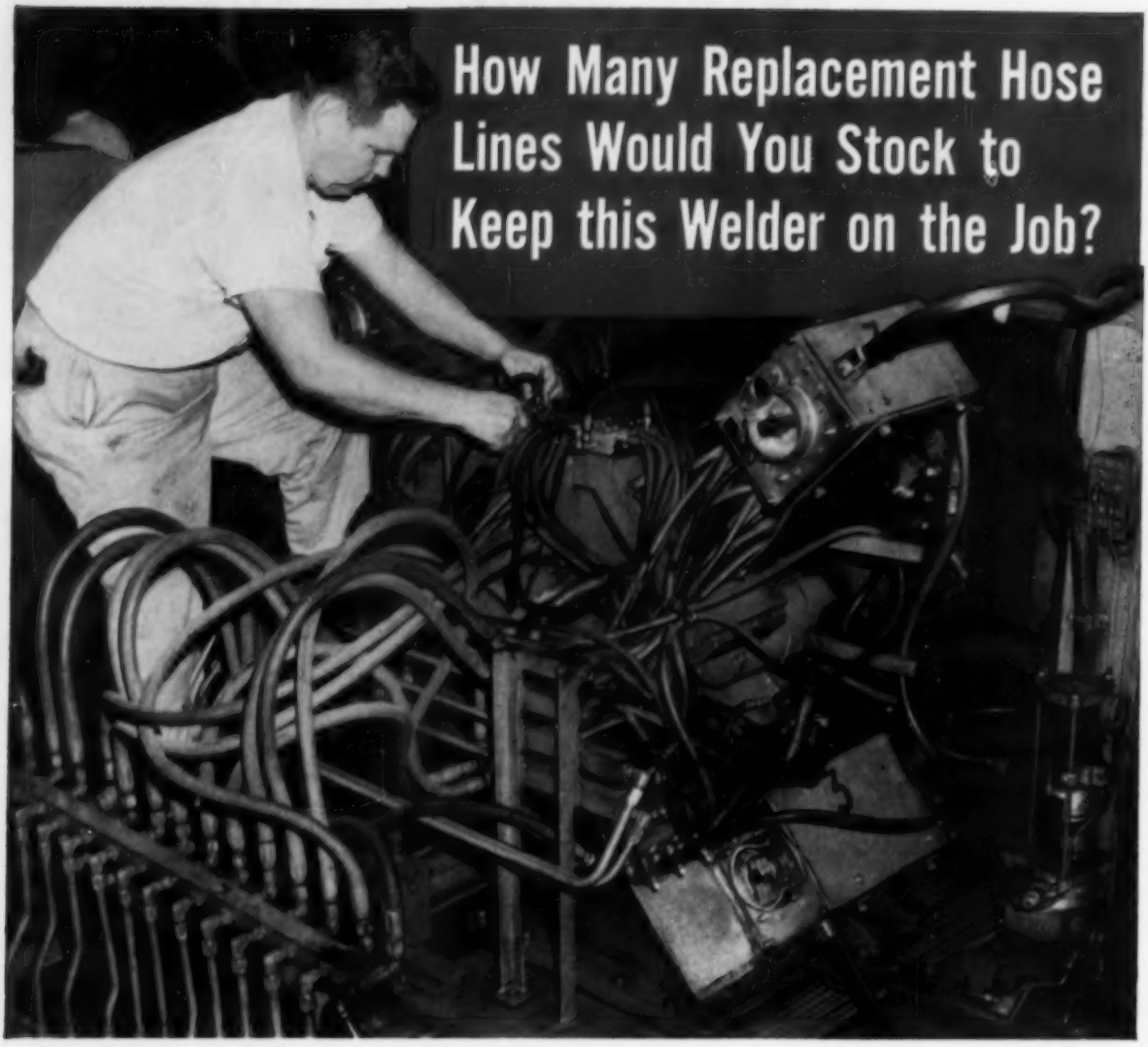


These sizes complete the Type 40 range of air-cooled compressors

Ingersoll-Rand

11 Broadway, New York 4, N. Y.

COMPRESSORS • GAS AND DIESEL ENGINES
ROCK DRILLS • PUMPS
TURBO-BLOWERS • AIR AND ELECTRIC TOOLS



At General Electric's Major Appliance Division in Louisville, Ky., this resistance welder fabricates cooking range bodies. 160 hydraulic lines are used on the equipment that positions each range body as it feeds through the welder.

G. E. maintenance men can replace any worn hose line from a surprisingly small supply of Aeroquip bulk hose and reusable fittings. It takes only minutes to assemble the hose and fittings using ordinary shop tools.

In your plant, too, the Aeroquip bulk hose method can save replacement time and eliminate the need for stocking pre-assembled hose lines. Check your Yellow Pages for your local Aeroquip distributor or write us.

Aeroquip

REG. TRADEMARK

AEROQUIP CORPORATION, JACKSON, MICHIGAN

IN CANADA: AEROQUIP (CANADA) LTD., TORONTO 15, ONTARIO

LOCAL REPRESENTATIVES IN PRINCIPAL CITIES IN U.S.A. AND ABROAD • AEROQUIP PRODUCTS ARE FULLY PROTECTED BY PATENTS IN U.S.A. AND ABROAD

facilities, a die shop and automatic polishing machines. It produces stainless steel and aluminum molding.

Black & Decker Opens Branch

Black & Decker Mfg. Co. Towson, Md., opened a factory sales and service branch at 4617 Jonestown Road, Harrisburg, Pa. It is under the management of E. H. Federschmidt, Industrial-Automotive Division district manager.

Caine Steel Buys Nesco Line

Caine Steel Co., Chicago, purchased the steel lithograph and coating line of Nesco Inc., Granite City, Ill., and will operate it as the Metal Decorating Division. Rod W. Key is in charge of the division.

Fastener Firm Enlarges Plant

J. Schwartzman Mfg. & Supply Co. moved into its enlarged plant in North Hollywood, Calif. The company makes sheet metal, wood, machine, lag and capscrews; carriage and machine bolts; and other cold-headed precision fasteners. The plant, which has more than 50,000 sq ft of floor space, increases productive capacity 100 per cent.

Enters Extrusion Field

General Impact Extrusions Ltd., a newly formed Canadian company, leased 9300 sq ft of floor space in Mimico, Ont., for the manufacture of collapsible metal tubes, capacitor shields and coil cans. An extrusion machine is included in a $100,000 investment in plant equipment.

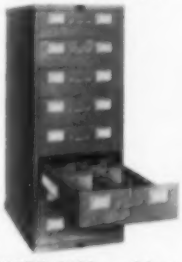
Mack Forms Electronics Unit

Mack Trucks Inc., Plainfield, N. J., organized Mack Electronics, a division, to expand its facilities in the engineering, development and sale of electronic equipment. Located at 40 Leon St., Boston, the division will supplement facilities of the electronics operation at the main plant. This is another major step in Mack Truck's diversification program. The first was in February, 1955, when Mack ac-

(*Please turn to page* 104)

Safe... BECAUSE OF DIEBOLD

SAFES . . . wide range of sizes in 1, 2 and 4-hour Underwriters labeled models.



INSULATED FILES . . . 1-hour Underwriters labeled . . . 1, 2, 3 and 4-drawer letter and legal models . . . check, cross-file and tab-card units. Combination locks available.

Immediately after a fire, everything you do will depend upon the condition of your records. If they have been preserved in a Diebold safe or insulated file, you can collect accounts receivable . . . prove your claim for settlement-in-full on fire-loss insurance . . . re-establish credit . . . and plan to resume business.

Experience proves that 43% of firms losing records . . . in fires . . . FAIL! If your records have been destroyed, will you be out of business?

NOW is the time to measure your fire-survival risk with the Diebold Fire Hazard Chart . . . and let us prove its validity with THE SEVEREST TEST, an interesting business-survival experience. Call your local Diebold representative, or write today.

PROTECT YOUR VITAL RECORDS WITH **DIEBOLD** SAFES AND INSULATED FILES

$64,000 QUESTION ... PROTECTED BY

Diebold®

INCORPORATED

1022 Mulberry Rd., S. E., Canton 2, O.

THE RIGHT SLANT. Her fashionable hat keeps its perky tilt, thanks to CF&I-Wickwire Hat Wire in the brim.

"NEITHER SNOW..." When the going's rough, drivers are thankful for tough, strong tire chains made of CF&I-Wickwire Chain Wire.

from holding smart hats in shape... to holding cars and trucks on snowy roads, nothing does the job like wire!

The dramatic variety of jobs that wire can fill—almost infinite in number—is encountered every day in hundreds of diversified industries. Shown here are only a few of the countless uses to which wire can be put.

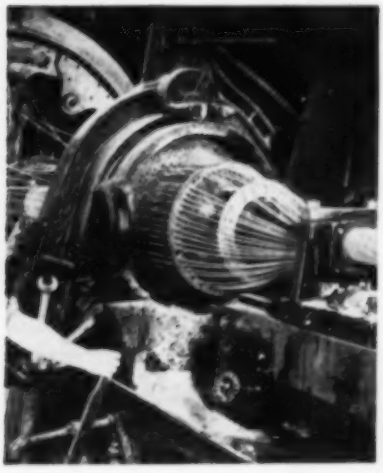
Wire, hair-thin to rod-thick, can be supplied with properties engineered to meet practically any need you may have for it. And CF&I-Wickwire Wire, with a century and a quarter of experience behind it, is ready to serve you by answering all your wire requirements.

Whatever you assemble, manufacture, or process, check into all the advantages you would gain by using CF&I-Wickwire Wire. You'll like doing business with CF&I-WICKWIRE, and the careful attention given your own particular requirements.

CF&I-Wickwire Wire is made in plants conveniently located from coast to coast. For detailed information, write our nearest district sales office.

SPEEDING AMERICA'S RECORD HOUSING PROGRAM. Stapling insulation to walls saves days of construction time and cuts building costs. CF&I-Wickwire Stapling Wire is used for all kinds and sizes of staples.

ALL WOUND UP. Here a submarine cable is being sheathed in CF&I-Wickwire Armor Wire for protection and resistance to mechanical failure.



DROPPING A MOUNTAIN with dynamite is accomplished with CF&I-Wickwire Fuse Wire for detonators.

IT'S CHILD'S PLAY to open today's sardine tins. Their sturdy key openers are made of CF&I-Wickwire Can Key Wire.

3143

CF&I-WICKWIRE WIRE

THE COLORADO FUEL AND IRON CORPORATION—Albuquerque • Amarillo • Billings • Boise • Butte • Denver
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now

you can get this brilliant finish directly on zinc die castings!

No electroplating--no mechanical finishing!

NEW IRIDITE® (Cast-Zinc-Brite)

brightens zinc die castings by chemical polishing, protects against corrosion

NOW, FOR THE FIRST TIME you can get a brilliant, decorative finish directly on zinc die-cast parts . . . without mechanical finishing, without electroplating! The luster is provided by the *chemical polishing* action of new Iridite (Cast-Zinc-Brite) solution. Even surface blemishes, such as cold shuts, are brightened by this new process. No electrolysis. No special equipment. No specially trained personnel. Just a simple chemical dip for a few seconds and the job is done. And, this new Iridite has been *tested and proved* in production.

CORROSION RESISTANCE, TOO! New Iridite (Cast-Zinc-Brite) provides exceptional corrosion resistance for bright-type chromate finishes . . . also guards against blueing or darkening by eliminating zinc plate formerly required in bright chromate finishing of zinc die castings.

AS A BASE FOR ELECTROPLATING—Lower mechanical finishing costs are possible where plated finishes are *required* since the brightness provided by this new Iridite may be sufficient.

LET US SHOW YOU what Iridite (Cast-Zinc-Brite) can do for you. Send us at least a half-dozen typical zinc die-cast parts for FREE PROCESSING for your own tests and evaluation. Or, for immediate information, call in your Iridite Field Engineer. He's listed under "Plating Supplies" in your classified 'phone book. *IMPORTANT: when you give us samples for test processing, please be sure to identify the alloy used.*

ALLIED RESEARCH PRODUCTS
INCORPORATED
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(*Concluded from page* 101)

quired two electronic companies (White Industries Inc. and Radio Sonic Corp.) now known as Mack Electronics Division Inc.

Liquid Carbonic Buys Firm

Liquid Carbonic Corp., Chicago, will purchase Western Oxygen Inc., Seattle, producer of oxygen, acetylene and medical gases. Western Oxygen is also a distributor of welding equipment and supplies.

Will Build Hardware Plant

Hubbard & Co., Pittsburgh, will build a pole line hardware plant in Plano, Tex. The 30,000-sq-ft plant will have hot-dip galvanizing equipment and a warehouse area.

Canadian Firm Expands

Canadian Pratt & Whitney Aircraft will build a 90,000-sq-ft, $5-million addition to its Ville Jacques Cartier plant, Montreal, Que. Part of the money will be spent for additional equipment and enlargement of helicopter facilities.

VACATIONS

Waldes Kohinoor Inc., Long Island City, N. Y., manufacturer of retaining rings, grooving tools and other products, will be closed from July 23 to Aug. 3, inclusive. The firm's sales, order and shipping departments will provide necessary services. The vacation closing does not apply to the company's factory representatives or distributors throughout the country.

ASSOCIATIONS

American Supply & Machinery Manufacturers' Association Inc., Cleveland, elected these officers for the fiscal 1956-57: President, C. T. Jordan, Charles Parker Co., Meriden, Conn.; first vice president, R. L. Hamilton, Dumore Co., Racine, Wis.; second vice president, L. H. Bellows, Sheldon Machine Co. Inc., Chicago; secretary, F. C. Emerson, Spartan Saw Works Inc.,

"...and then they put that hot bar of metal between the upper die and the lower die and.....WHAM!"

Look who's showing off! Well, he doesn't know everything—yet! But he sure has learned something about his old man's forging business from that color booklet in his back pocket.

It's called "Forgeland, U.S.A."—an interesting, instructive book about *your* business and *ours*, written in *his* language and with pictures, too! We've prepared it here at Erie, because we think it's nice for Pop to be a hero in his own home—and we're all for encouraging it.

To quote your beloved smart-aleck, "Aw c'mon Dad, get me the book will yuh, huh, please, huh, please—it's for FREE, anyhow . . . not even any box tops or hammerscale to send in!"

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If you have a raft of kids—send for a raft of books:

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...fast, modern transportation will serve your plant

161 MILES OF WOODEN TRACKS, surfaced with strap iron, made the Wilmington & Weldon the world's longest railway in 1840. Today, the little line forms part of one of the five major railroads that can serve your plant in this "keystone corner" of North Carolina. That's beside the 20 modern truck lines and 300 steamship lines calling at nearby deepwater ports.

YOU'RE CENTRALLY LOCATED on the East Coast, with favorable freight rates to the Mid-west. Coal, peanuts, chemicals, soybeans, lumber, cotton, resin, woodpulp and many other materials roll in at short-haul cost. And a 3,800 mile network of modern highways brings an ample force of conservative, southern manpower to your plant parking lot.

VEPCO'S NETWORK—a modern power-full ally for your new plant—has added 300,000 new kilowatts of generating capacity in 1955 . . . with 300,000 more under construction and ready soon.

FOR COMPLETE FACTS about the mild, no-shutdown climate, abundant water supply from two rivers, taxes, zoning and other "keystone" advantages . . . PLUS confidential help in selecting choice plant site or ready-built plant—write or telephone VEPCO, serving THE TOP OF THE SOUTH.

VIRGINIA ELECTRIC and POWER COMPANY

Clark P. Spellman, Director—Area Development
Electric Building, Richmond 9, Virginia • Phone: 3-4261

Springfield, Mass.; and treasurer, Lewis Barnard, Lufkin Rule Co., Saginaw, Mich.

Plumbing Brass Institute, Pittsburgh, established an import committee, including representatives from each of the institute's four product sections. The committee will be responsible for finding out what plumbing brass goods are coming into this country; whether the material is being dumped on the market; and whether it is marked in accordance with the U. S. tariff marking laws.

NEW ADDRESSES

Detroit Steel Corp., Detroit, opened a district mill sales office at 3344 E. 80th St., Cleveland, in charge of E. A. Nowak. The firm moved its Indianapolis district sales office to 2415 N. Meridian St. E. B. Scott is district manager.

Van Straaten Chemical Co. moved its sales headquarters and main laboratory to 630 W. Washington Blvd., Chicago. The firm makes industrial cutting, grinding and metal cleaning compounds.

Misco Fabricators Inc. moved to larger quarters at 3564 Toledo Ave., Detroit 16, Mich. The firm designs and fabricates heat-resisting alloy and stainless steel equipment.

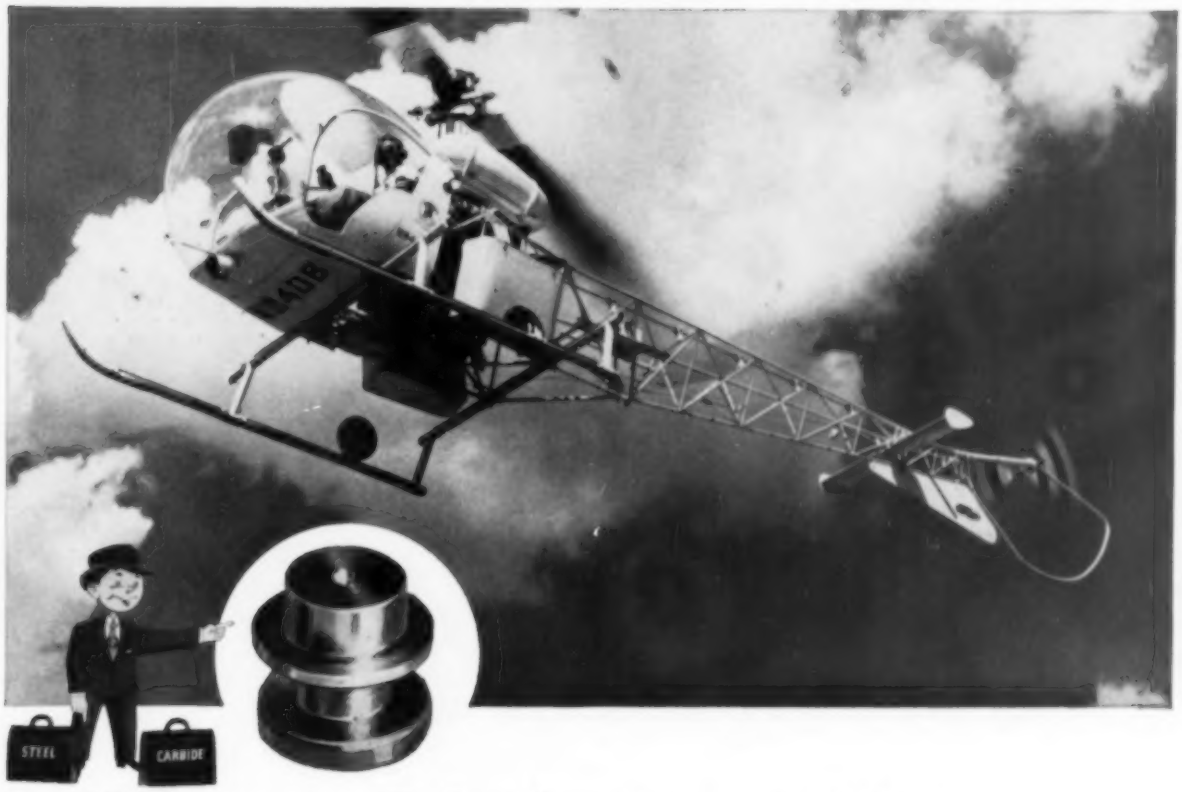
REPRESENTATIVES

Atlantic Metal Hose Co., New York, appointed Moore-Handley Hardware Co., Birmingham, stocking distributor for Alabama and areas in Tennessee and Georgia.

Alloy Steels Inc., Detroit, will distribute graphite steels produced by **Timken Steel Division, Timken Roller Bearing Co.,** Canton, O.

Reed Rolled Thread Die Co., Worcester, Mass., appointed Lee Horneyer Co., St. Louis, as representative in that territory for its cylindrical die thread and form rolling attachments for screw machines, thread rolls and knurls.

"Mission accomplished" at Bell Aircraft...with FIRTHITE TXH



133% more needle bearing pins per grind

Down Fort Worth way at famous Bell Aircraft Corporation, they made production tests on the *new* FIRTHITE TXH Carbide . . . turning and facing needle bearing pins from SAE 4140 steel.

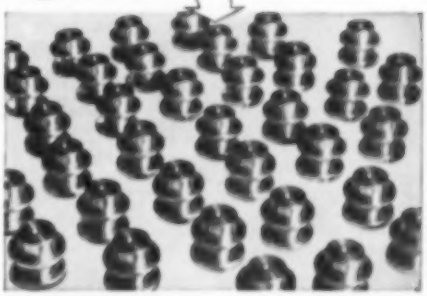
The results speak for themselves:

- 133% more bearing pins per grind.
- More than twice as many pieces per grind as nearest premium grade.
- Seven times more pieces per grind than two other competitive grades.
- Only .007 stock removed to resharpen compared with .025—.035 for competitive grades.

Truly this test proves, as do others all over the country, that FIRTHITE TXH is easily the outstanding carbide in its field . . . a *premium grade* at *no* premium price.

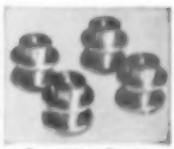
Yes, FIRTHITE TXH is a completely *new* carbide concept . . . a combination of materials and processes designed specifically to do heavy-duty, high-production cutting operations better than they have ever been done before!

You, too, can make important savings, and increase production with TXH. It's available *now* in all standard tips and tools. Try it today.



FIRTHITE TXH—35 PER GRIND

Competitive Grade A—15 per grind



Competitive Grades B & C—4-5 per grind

R-316

PRODUCTS OF FIRTH STERLING METALLURGY

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Tool & Die Steels
Stainless Specialties
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AUTOMOTIVE . . . New Danly Underdrives form the car bodies of tomorrow—at lower cost for a highly competitive market.

Danly

presses produce more

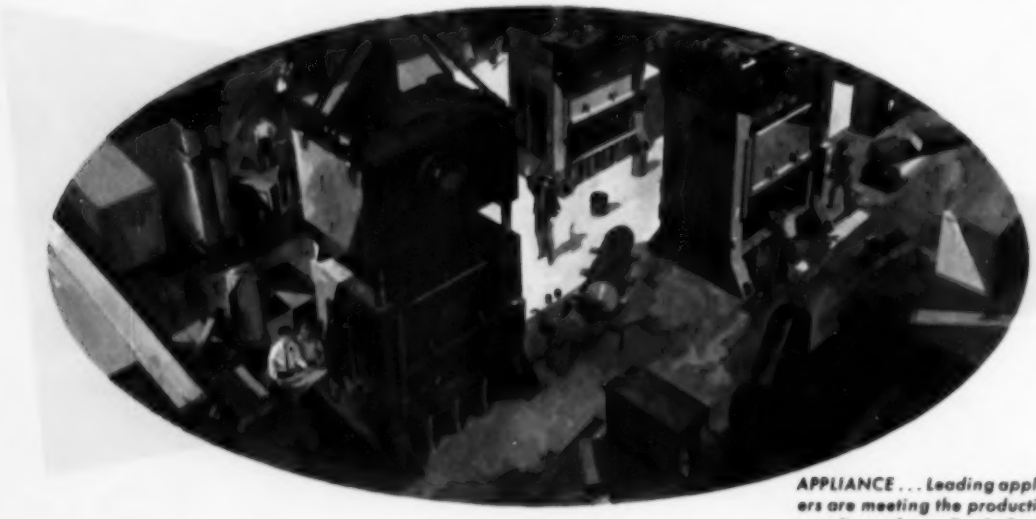
With Competition at an All-Time High, Successful Production Programs Are Being Built Around the Cost-Saving Advantages of Danly Presses

There are three basic reasons why leading industries invest millions of dollars each year in Danly Presses: 1) Engineering leadership, 2) Performance, 3) Dependability.

Engineering leadership—In new mechanical features, in safety, in operating efficiency . . . Danly has set the engineering pace. Every Danly Press is designed to meet specific, current production needs.

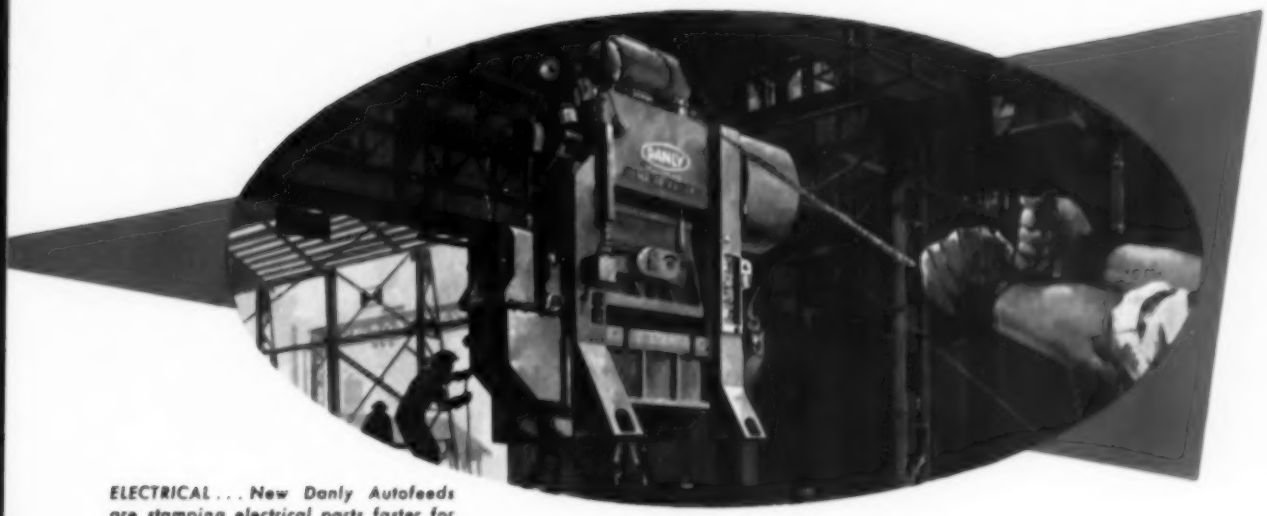
Performance—Each press type features all of the famous Danly advantages: extra rigid, balanced, precise construction; completely automatic oil lubrication system; cool-running clutch that lasts many times longer than conventional types; exclusive Danly control arrangements that promote operator safety and minimize accidental press damage.

Dependability—Danly engineering and construction pays off in more stampings over a longer period of time. Performance records in the largest shops prove that Danly Presses require less maintenance, greatly reduce need for spare parts.



APPLIANCE . . . Leading appliance manufacturers are meeting the production challenge with new lines of new Danly Straight Side Presses.

in every industry



ELECTRICAL . . . New Danly Autofeeds are stamping electrical parts faster for less—with longer die life.

. . . at lower cost

Send for these Danly Catalogs . . .

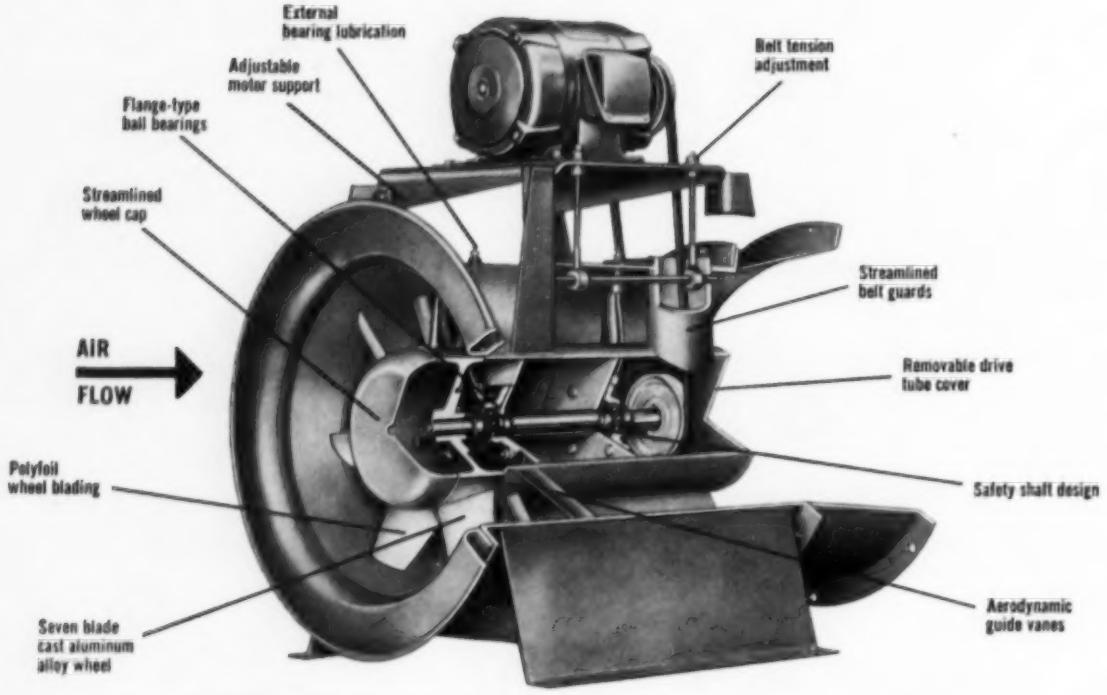
They Hold the Answer to Modern Mass-Production Stamping Problems

DANLY MACHINE SPECIALTIES, INC.
2100 South Laramie Avenue • Chicago 50, Illinois

DANLY

NEW Improved Westinghouse Axial Flow Fans

for Industrial air, fume, vapor handling jobs!



CUTAWAY VIEW OF WESTINGHOUSE AXIFLO® VANEAXIAL FAN FOR GENERAL APPLICATION.

COMPLETE NEW LINE

With: volumes from 1,700 to 100,000 CFM—static pressures up to 3¼"—14 sizes, Vaneaxial or Tube Axial, direct-connected or V-belt driven, with wheel diameters from 15" to 72".

- **Space Saving** . . . compact Axial Flow design permits installation directly into duct work.
- **Improved performance** . . . non-overloading horsepower feature permits use of smaller motors.
- **Least maintenance** . . . rugged practical construction insures continuous trouble-free operation.

For complete application service, call your nearest Sturtevant Sales Engineer, or write Westinghouse Electric Corporation, Sturtevant Division, Dept. 4F, Hyde Park, Boston 36, Mass.

Spray booth Vaneaxial Fan specially designed to provide easy access required for paint spray exhaust!

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*WHERE **BIG** THINGS ARE HAPPENING FOR **YOU***

J-80592

STEEL
June 11, 1956

Technical Outlook

EXTRUSIONS GROW—Airframe makers are becoming better customers for steel extrusions, reports Jones & Laughlin Steel Corp., Pittsburgh. Much of the interest centers on alloy grades which means J&L's new extrusion mill (STEEL, Feb. 21, 1955, p. 78) is processing more alloy steel extrusions as well as carbon grades. The company is also developing know-how for extruding titanium. Also in the picture: Extruded parts of precipitation hardening stainless steels for guided missiles and zirconium for atomic reactors.

SCORE FOR MO—The abrasion resistance of molybdenum-nickel borides makes them useful as die and mold liners and plungers for automatic presses producing small parts from highly abrasive materials. Lower raw material cost and lower density of the borides offer commercial advantages over standard tungsten-carbide grades.

HONEYCOMB BOND—A lower melting nickel plate, deposited chemically (Kanigen process), may find use in honeycomb structures (STEEL, June 11, p. 112). When cover sheets are preplated, the nickel becomes a brazing alloy to bond them to honeycombed filler for a unified structure.

HOT JOBS—Kentanium (a group of heat resistant titanium carbide base compositions) is doing a number of industrial jobs above 1800°F. Protective rings made of it increase scarfing-tip life 30 to 40 times. It's employed for flash trimming welded steel tubes used in making tubular metal furniture and for hot spinning pipes. Other high temperature uses: Balls for hot hardness testing, inserts for hot rod mill guides, inserts for hot die forming and hot extrusion, and tensile test heads. Report comes from Kennametal Inc., Latrobe, Pa.

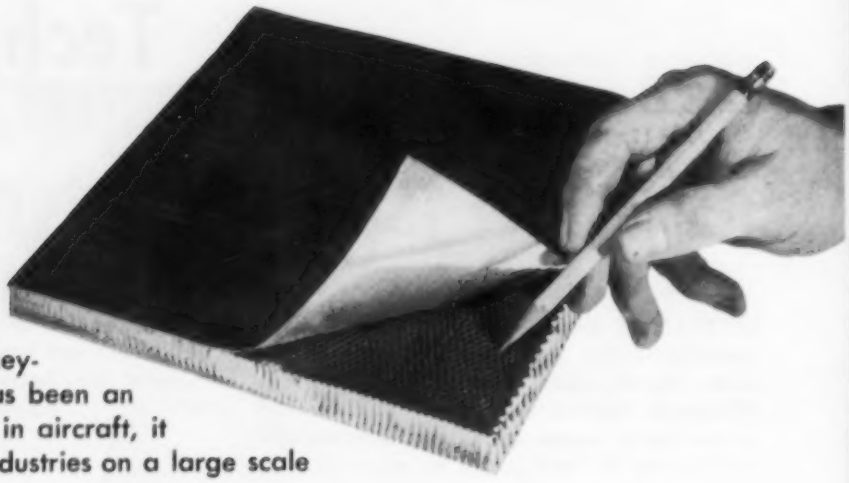
LONG TIN LINE—At Bethlehem Steel's Sparrows Point plant, yellow stripes for guiding traffic have lost out to galvanized steel strips. The narrow strips, which are secured to wood block floors with screw-nails, hold up better than paint.

GUARDS AGAINST RUST—A small quantity of VCI powder will prevent rust formation on the inside of empty steel drums and pails for at least a year. This conclusion comes from tests conducted by Daubert Chemical Co., Chicago, in co-operation with a large container manufacturer. Cost is 2 to 4 cents per 55 gallon drum.

MONORAIL—Most monorail carriers hang, but not the new Rex Railporter. Hopper carriers, self-propelled by small gasoline engines, ride atop a portable monorail. Developed for carting bulk materials on construction projects, it has interesting possibilities for shop use. Chain Belt Co., Milwaukee, makes it.

COLOR TV ON THE JOB—At the Hanford plutonium plant, GE scientists are using color television to help get the work done in radioactive areas. Crane operators who formerly watched their work in one of the "hottest" areas through a periscope now have a color, closed-circuit TV system supplied by General Electric's Broadcast Equipment Section, Syracuse, N. Y. High image brilliance on the TV screens and added depth perception make the giant crane hooks easier to operate.

Metalworking Outlook—p. 61 *Market Outlook—p. 161*



To most of the metalworking industry, the progress of honeycomb structures in aircraft has been an unknown. After a fast start in aircraft, it is ready to work into other industries on a large scale

HONEYCOMB PANELS:

On the Threshold of a Boom

THOUGH planemakers have chosen to circumvent the aerodynamics of the bee in their search for better aircraft, they have borrowed liberally from his talents as an architect.

What they've learned has led to a new industry. A score of new companies are set up to make honeycomb core material for sandwich structures. Nearly every major aircraft company is studying honeycombs—many are using them in production. Along the way, this work is bridging the gap to other industrial applications.

You are a potential user if your assembly requires any or a combination of these qualities: Strength, rigidity, lightness, protection against heat or vibration, or acoustical properties.

What Is It?—Unlike its relatives in the sandwich-panel family, honeycomb structures have a core that's made from thin ribbons of impregnated paper, plastic or metal. The zigzag ribbons are joined at their nodes to form a honeycomb pattern. Slices of this core are sandwiched between two sheets of skin metal.

Made up of three relatively frail sections, the panels behave according to the rule that in unity there is strength.

Advantages—Honeycomb's claim to fame comes from two principal sources: Its phenomenal strength-weight ratio and its high rigidity.

The honeycomb core supports facing sheets, so that the panel can be stressed up to the point of full yield, say 65,000 psi.

The honeycomb also exhibits exceptional rigidity. In a brochure, Honeycomb Structures Co. Inc., Los Angeles, advises that, for equal rigidity, birch plywood is five times as heavy as honeycomb; aluminum is ten times as heavy; steel is 16 times as heavy.

More Plusses — A honeycomb panel with a cotton or paper core, has a thermal conductivity equal to dry cork. This sets it up for wide use as an insulating material for refrigerators, insulated shipping cartons and refrigerated railroad cars and trucks. This value can be stepped up by filling core cells with foam resins.

Fire resistance of the panel is proportional to the resistance of the facing material. It will be used on fire walls and doors. Couple fire resistance with low thermal conductivity, and you place honeycomb in line for jobs on heat treating furnaces and other hot spots.

Wide Range—Standard core materials include plastics, impregnated paper and cotton, glass fiber, aluminum and stainless steel. Metallic skins include aluminum, magnesium and stainless.

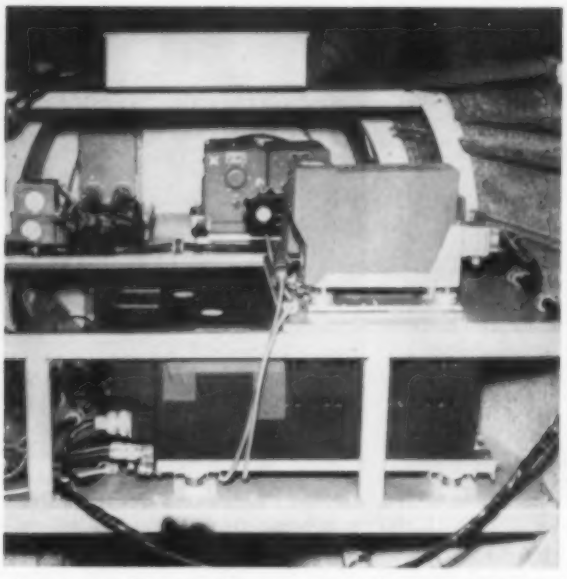
Many users will part company with aircraft as this industry goes on to stainless and the higher alloys for the tough jobs. For one thing, few industrial applications will call for the high properties of the tougher honeycomb (stainless will work at 1800°F). Second, the cost is high ($400 for a cubic foot of the core alone).

Coremaking—Two basic systems have been used. The first consists of butting crimped ribbons of the material cheek to cheek and sticking them with adhesive. (Steel panels are brazed or welded.)

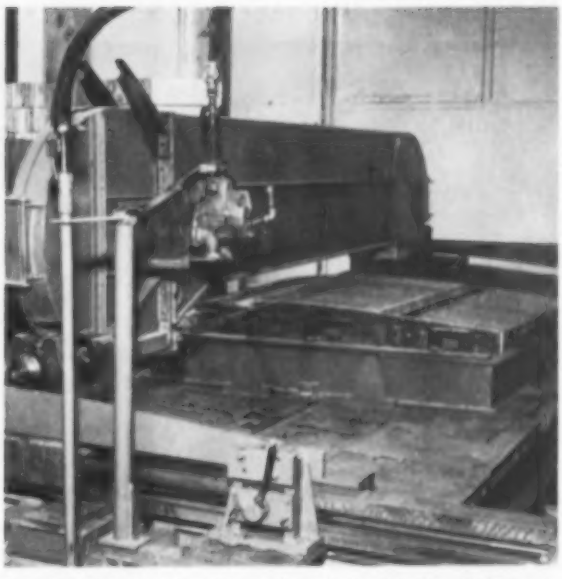
In the second method, sheets of foil are striped with adhesive, then stacked one on top of another, with the adhesive areas directly over each other. After the adhesive has been set, the core billets can be sawed or milled to shape (see top of page 114). Then the slab is expanded into a honeycomb.

A third production method looms on the horizon. Multiple Extrusions Inc., Winona, Minn., is extruding synthetic rubber honeycombs on a production basis. They're used in railroad journal box lubricators. Robert Harkenrider, president, says they have extruded test samples of aluminum and impregnated paper cores. Mr. Harkenrider is convinced the method will be commercially successful. Extrusion could substantially lower the cost of the core material. An apparent limitation: It's tough to extrude walls thinner than about 0.040-in. Metal cores use about 0.002-in. foil.

Fabrication—Concerted development programs in the aircraft in-



These top and bottom shelves are typical commercial aircraft applications of aluminum honeycomb. Mounted in the nose of the Beechcraft, Super-18, twin-engine transport, these shelves hold radio equipment



Developed by engineers at Glenn L. Martin Co., Baltimore, this band saw is contouring aluminum cores. It produces surfaces to within 0.010-in. tolerances. The sawed surface needs no sanding for final accuracy

dustry and the laboratories of adhesive manufacturers have turned up a wide variety of adhesives that work on honeycombs. Manufacturers such as Minnesota Mining & Mfg. Co. and Armstrong Cork Co. offer a wide range of thermosetting and thermoplastic adhesives.

Choice of adhesive is governed by the job the part will have to do and the conditions under which it will operate. General procedure for bonding consists of these steps: Apply film to thoroughly cleaned and dried surfaces; assemble bonding surfaces; heat and apply pressure. Heat sets the adhesive, and the pressure assures a tight fit between the bonding surfaces.

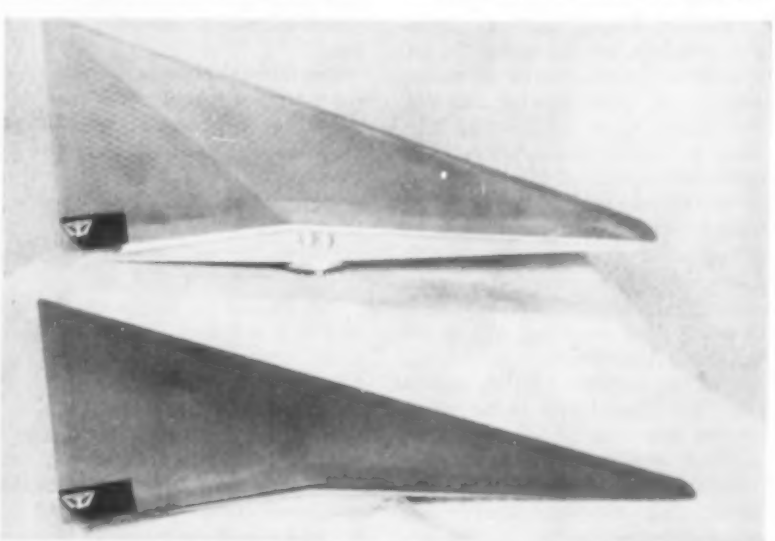
Duty—Where conditions under which the panels will serve are relatively severe, thermosetting adhesives are used. They call for curing under pressure at 200 to 400°F for 30 to 60 minutes.

Where panels will operate at less than 200°F, thermoplastic adhesives can be used. Armstrong's D-253N is sprayed or rolled on, dried and heated. Surfaces are placed in position and passed through a pinch roll. The adhesive shows a shear strength of 1000 psi at 77°F.

Adhesive makers also are supplying films or tapes that are cut to shape and simply laid between the bonding surfaces before curing.

More, Better — Present limitations of adhesives for honeycombs aren't likely to last. Fred J. Wehmer of Minnesota Mining's adhesives and coatings division, Detroit, says that the "lack of aging data on modern adhesives and sealers used in and with honeycomb panels and the lack of equipment and procedures for applying these products" are definite limitations. They are being overcome by "weathering, aging, product evaluation programs and by close co-operation between adhesive makers, equipment manufacturers and the concerns making and installing panels."

Glenn L. Martin Co., Baltimore, the aircraft pioneer in honeycomb, developed its own thermosetting adhesive (FM-47) in both liquid and supported film. The company says it's working on a program to obtain more design criteria for joints bonded with Marbond (the tradename) adhesive and subjected



Prototype missile fins are made from stainless honeycomb at Solar Aircraft Co., San Diego. Honeycomb cores are contoured before panel assemblies are brazed together

Honeycomb comes to North American Aviation Inc. in large, tightly compressed sheets. First, strips of predetermined width are cut

A metal bar is fastened to each end of the sawed strip. Here the compressed strip is being expanded. Next, core sections are cut to a pattern

Cut and cleaned core pieces are fitted to a board that's shaped to the contour of the outer skin of the panel. When they are in place, the contour is sawed on a band saw

to temperatures ranging from −70° to 800°F.

Shapes—Most honeycomb panels call for flat parallel surfaces. Simple contours are made by contour sawing or milling on the core before assembly. Surfaces generally must be true to within about 0.010-in., so there will be a continuous bond over the entire area. When a finishing operation on the core is necessary to get this tolerance, it can be done by sanding with abrasive belts. Also, electrolytic grinding shows great potential for honeycombs.

Complex shapes, such as cones and cylinders, can be molded in an autoclave (steam-heated pressure cooker) or other special fixtures that bond cores and skins. The panel is shaped as the adhesive is cured. Variations of the hexagonal cells may enhance the flexibility of the core under some conditions.

Test — Tedious quality control and careful shop handling conditions figure heavily in the quality of honeycomb produced. To check the bond between the core faces and skins, samples can be sawed from each panel and these, when drilled, sawed or pulled, will indicate the quality of the bond.

When full potential strength and rigidity of the panel are musts, nondestructive testing is the answer. It's usually done sonically or with x-rays. At Rohr Aircraft Corp., Chula Vista, Calif., engineers use both methods, plus a fluoroscope. Solar Aircraft Co. engineers at San Diego use both, but lean toward x-rays.

At Beach Aircraft Corp., Wichita, Kans., engineers devised their own sonic testing equipment. It uses an electric amplifier that puts sound through both earphones and speakers. Gearwheels are run over the surface, and a change in sound indicates an imperfect bond.

Allen B. DuMont Laboratories Inc., Clifton, N. J., recently announced a new ultrasonic tester that uses a crystal transducer to apply ultrasonic stresses to the panel.

Commercial Ranges — Inherent strength and rigidity of a core depends on the material, wall (foil) thickness, cell size and core thickness. Commercial metal cores are made from foil 0.0007 to 0.007-in. thick. Cell sizes are ⅛, 3/16, ¼ and ⅜-in. across. The smaller the cell, the stronger the core.

Future—In its search for better and tougher honeycombs, the aircraft industry and its suppliers have solved a hatful of problems for industry. Example: Their solution to core support for rugged milling and contouring operations. They set a core in water and froze the block. Then they machined it, ice and all. More recently, they've had success supporting the cells with resin.

The cost of honeycomb is relatively high. Panels 1 in. thick with lightweight impregnated paper cores and aluminum skins, cost about $2.25 a square foot. If the core is aluminum, the cost is from $3.50 to $4.50.

The answer to high cost will come with volume. Aircraft applications alone have not been able to support mass production.

There's a word of caution about cost, though. Honeycomb can't be compared directly with a competitive panel or sheet. It's a rigid structure in itself, may eliminate many supporting members, brackets and other parts of present as-

Armstrong Cork Co.

Built by Panelfab Products Inc., Miami, Fla., these doors are installed at the West Lab school of the University of Miami in Coral Gables. The aluminum skin is adhesive bonded to plastic impregnated paper cores

Contoured core is fitted to the skin. The skin has been covered with adhesive-impregnated cheesecloth. The panel is then baked to cure the adhesive

semblies. The leading edge of one aircraft stabilizer, for example, used to require 25 stiffeners. Honeycomb eliminated stiffeners and the cost of putting them in.

Bull's-Eye—The first industry to use honeycombs on a large scale (outside aircraft) will be architecture. The strong trend toward dollarwise prefabrication is bound to pick up honeycomb in its wake. It is, by nature, a prefab material.

Evidence of this potential is already on the books. Lightweight movable panels and doors are being made from honeycomb. The new Ford central staff office building Dearborn, Mich., is adorned with honeycomb curtain wall panels.

Prefab home builders are looking at honeycombs with an eye to improving wall and roof sections while eliminating a healthy portion of present supporting structure.

Aircraft and buildings may be charter members of the honeycomb clan, but almost everyone close to the development of the material feels that they are only the beginning.

The lowly bee has unwittingly become a master architect for industry.

A Look at the Market

With only a couple of years behind it, honeycomb already is established in the aircraft industry. Now it has begun to spread to other applications. Here is a list of jobs that are, or will be, naturals for the material:

All-Metal Panels	Nonmetallic Core Panels
exhaust flue ducting	walls
vacuum ducting	movable partitions
pressurized tanks	roofs
liquid storage tanks	doors
large fan blades	tables
machine housings	desk tops
fluid heat exchangers	railway cars
high and low temperature insulation	truck and bus bodies
	truck trailers
acoustical insulation	refrigerators
insulating vacuum flasks	shipping containers
impact energy absorbers	material handling pallets
microwave reflectors	tooling
nuclear reactor structures	platforms
	scaffolding
	canopies and awnings
	lawn furniture

Based on information supplied by Solar Aircraft Co.

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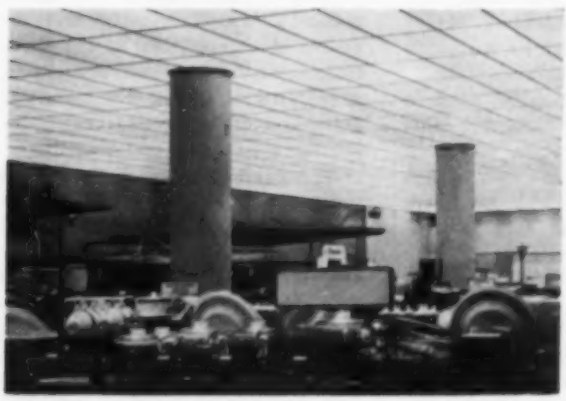
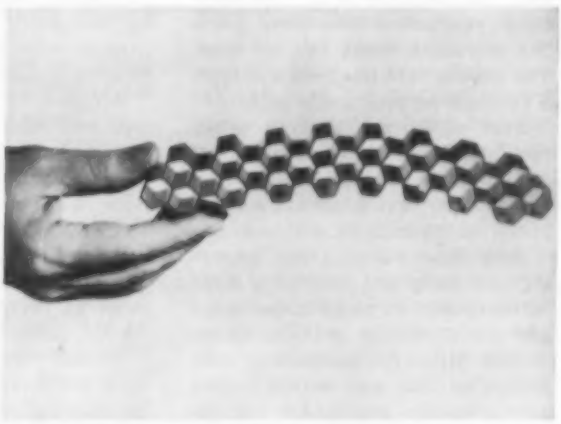


Developed by Hexcel Products Inc., Oakland, Calif., these light diffusing panels are made from aluminum honeycomb. They are ¼-in. thick, weigh 2 ounces per square foot. Ideal for offices, they also aid acoustics and can be hung under sprinklers



Multiple extrusions in the form of honeycomb cores are the product of Multiple Extrusions Inc., Winona, Minn. This one is made from Buna-N rubber. The manufacturer feels he also can extrude aluminum cores

In this automatic salt bath setup . . .

Chain Parts Colored Twice as Fast

By CARL E. JOHNSON
President
Acme Chain Corp.
Holyoke, Mass.

"HIGHLY ECONOMICAL" is the way Acme Chain Corp., Holyoke, Mass., describes its process for coloring (bluing and browning) roller chain parts.

A continuous wire belt conveyor carries parts in and out of a molten salt bath furnace. Compared with the previous batch-type operation, production of colored parts has increased about 130 per cent. The rework rate has been cut from 5 per cent to practically nil.

Part of the operation is a salt reclaiming unit that saves about 100 lb of costly coloring salt a week. This device has cut salt replenishment costs 20 per cent.

Why Color—Bluing and browning ordinarily are used as a decorative finish, as on nuts, bolts and gun parts. It also provides an excellent base for retaining rust-inhibiting oils and waxes, which are primarily responsible for the effective corrosion resistance of the finished parts.

Uniform coloring of roller chain plates is an important product quality of Acme chains. Our customers, who build machinery for such fields as food processing, packaging, textile, petroleum and agricultural implements, prefer colored chain for both its corrosion resistance and appearance.

Before—We originally used a gas-fired salt bath furnace. This was a batch operation requiring almost constant supervision to produce quality work. Parts were treated in baskets, and it was necessary to agitate and tilt the baskets several times during treatment to prevent a rainbow effect on the parts.

Proper immersion times and bath temperatures, critical factors in coloring steel, were mostly dependent on the operator. Furnace recovery time was slow.

Now—The major component of the present coloring system is a 60-kw salt bath furnace, built by Ajax Electric Co., Philadelphia. The unit is heated by 12 immersion-type resistance heaters. Working dimensions: 12 ft x 12 in. Salt bath depth: 16 in.

The rest of the equipment, excluding such stock items as the loading hopper, motors and speed reducers, was fabricated and installed by Acme. Unlike the shoemaker whose children never had shoes, we equipped the external drive and internal conveyor mechanisms with Acme roller chain.

Operation—Parts to be colored are loaded into a hopper driven by a variable-speed drive. (The speed of the rotating hopper determines the rate at which work is charged into the salt bath furnace.) Parts from the hopper are deposited on the moving flat wire belt which carries them down into the molten salt. After their timed trip through the furnace, they are quenched in water, completing the coloring cycle.

The conveyor is an 11-in.-wide,

Operator opens inlet valve to salt reclaiming trough. Pumping quench water into the trough and allowing it to drip back into the bath has cut salt replenishment by 20 per cent. Inset shows typical chain parts which are colored in this setup

wire-mesh belt with cross supports on 7½-in. centers and 1¼-in. double-pitch chains on either side. Sprockets at both ends of the furnace drive the conveyor; channels fastened to the sides of the salt pot guide it through the furnace. Weight of the chain and parts hold the belt in the channels, eliminating the need for rollers or bearings below the surface of the bath. A 1-hp motor and speed reducer powers the belt through a clutch which can be operated at either end of the furnace.

Processing Cycle — Parts are pierced and blanked from SAE 1050, 8650 and AISI 5140 steel strip. After tumbling they are hardened in air-type furnaces. Heat treating cycle: Austenitize at 1550°F for 30 minutes, quench in 125°F oil, wash, dry, draw at 750°F for 1 hour. Final hardness is Rc 42-43. After thorough cleaning, parts are transferred to the coloring department.

About two-thirds of the parts get a bluing treatment; the rest are browned. (Certain plates are colored brown for identification purposes.) Heat coloring of steel results from an oxide coating formed on the surface. The color is determined by the time and temperature at which the process is carried out. We use a standard, low-temperature quenching and drawing salt (potassium nitrate, sodium nitrate and sodium nitrite) in the coloring furnace.

Time-Temperature—For bluing, the time-temperature cycle of the parts in the molten bath can vary from 120 seconds at 620°F to 30 seconds at 710°F. Different cycles are used for different shapes and sizes. Browning usually is done at 600°F for 45 to 60 seconds. Over 800 lb of parts can be processed an hour (about 93,000 of the smallest pin plates, or 9000 of the largest bushing plates).

After coloring, parts are rinsed in hot water, drained and coated with oil. They are whirled in a centrifuge to throw off excess oil and then sent to the roller chain assembly department.

Salt Reclaiming — To reclaim the salt carried by the parts into the quench tank, we built a trough (6 ft x 1½-ft x 8 in.) over the salt bath. At the end of each day, all quenching water is pumped into the trough. Pet cocks at one end of the trough are opened to let the solution drip back into the furnace. The next day we start off with fresh water in the quenching tank and repeat the procedure.

We calculate that we save about 100 lb of salt a week (weekly make-up is 400 lb). The old batch-type system, which had no salt reclaiming unit, required about 1000 lb a week.

Water can be added safely to the low temperature nitrate-nitrite salts without impairing the bath. In fact, we clean the furnace by hosing it with water, and we wash the frozen salt off those parts of the conveyor above the bath when starting up in the morning. Spattering is not severe, and the water in the bath soon evaporates.

All Costs Down — Maintenance costs for the coloring unit are low. Three times a year we shut down the unit, bail out the salt, remove parts and foreign objects that have fallen in and clean out the sediment.

About once a year the roller chains that carry the conveyor through the salt are replaced. In three years of almost continuous operation, the furnace has required little maintenance—only the replacement of a few immersion heaters.

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Keep the chart simple like this one. Use contrasting colors for each shift, pep up the competitive spirit. All the operator has to do is mark his production each hour, connect them with straight lines

Keep Score on Production

A simple system that uses a chart for each operation pinpoints trouble, tells whether production stands ahead or behind plant work standards, improves worker interest

"HOW am I doing?" isn't a mystery to the man on the line when he has his own production chart. A simple, hour-by-hour graph for each machine tells how production compares with work standards, keeps employees' morale at a high level and helps management correct mechanical or personnel deficiencies.

The system is being used successfully at the John Bean Division of Food Machinery & Chemical Corp. The San Jose, Calif., plant makes guided missile storage containers for the U. S. Army.

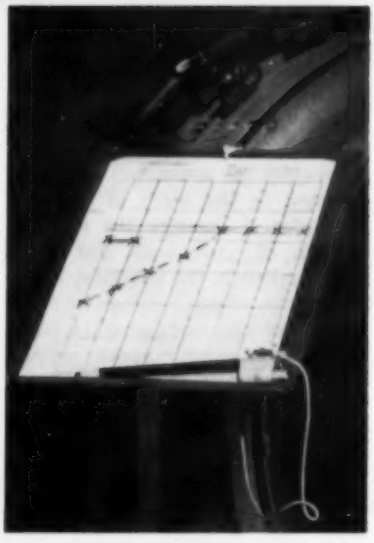
How It Works—Each work station has a simple chart which is divided horizontally into hours and vertically into work units. Each chart covers two, 8-hour shifts. A double line (the standard production rate) runs from left to right.

As each hour passes, the workman marks his production with a large "X" and draws a line to the previous mark. Contrasting colors for each shift emphasize the competitive spirit. As the curve progresses, it can be compared with the work standard indicated by the double line.

A normal curve tends to run somewhat below the work standard and picks up later, so that the total units produced equal the work standard for the day.

Copies of hourly progress charts are conspicuously posted for maximum effect. Performance can be observed from day to day as well as from hour to hour.

Corrective Action—By looking at the curve, supervisors can tell where production is slumping. Such factors as late starts, fatigue, stock flow, lubrication time and extended absences are pin-pointed and corrections made by additional operator training, work load adjustments and improved maintenance or tooling. Lost time chargeable to machine failures is noted on the reverse side of the chart and forms a permanent maintenance record.



This is how the John Bean Division mounts the chart at each operation. Note the simple sheet metal holder

Satisfaction — Management at the California plant rates the workman's satisfaction as its most important benefit from the charts. As the worker begins to understand where he stands in relation to what's expected of him, his job proficiency improves, and he takes interest and pride in his operation.

PRODUCING PRESSURE VESSELS

Profitably

CLEARING PRESS RIGHT ANSWER FOR TAIT MFG. CO.

Tait Mfg. Co. in Dayton, Ohio found the right answer for production of pressure vessels in the Clearing double crank press shown here. The vessels are produced from .025" stainless steel blanks which are drawn to a depth of 5". High blankholding pressure (70 tons) required at the start of the draw requires that the press develop high tonnage 5" up from bottom stroke. Normally these requirements would call for a press far larger than the one shown at right. However, Clearing engineers designed the press with an oversize drive—a 500-ton drive in a 250-ton frame. Two sets of dies are used in the press, one to trim and draw, the other to pierce and emboss. The press is equipped with two cushions in the bed. Seventy tons of cushion pressure is provided on the draw side for blankholding. This pressure is reduced to 35 tons automatically at a point 1½" down on the draw. The other cushion provides 10 tons of stripping pressure.

If you are looking for an efficient and economical method to produce your product more profitably, call on Clearing Machine Corporation to discuss your problem.

This Clearing double crank press with an oversize drive develops high tonnage five inches from bottom stroke, easily solving the problem of a 5" draw in stainless steel.

Write for colorful brochure, "Thinking about a better way to do the job?" No obligation.

CLEARING PRESSES THE WAY TO EFFICIENT MASS PRODUCTION

CLEARING MACHINE CORPORATION *Division of U. S. INDUSTRIES, Inc.*

6499 W. 65th Street, Chicago 38, Illinois • Hamilton Plant, Hamilton, Ohio

Summary of Operating Data	
Days operated	31
Oxygen enrichment	1.5%
Moisture (grains/cu ft)	6.0
Wind blown (cfm)	75,000
Equivalent wind (cfm)	80,400
Burden	24,800
Number of charges	204
Hot blast temperature	1160°F
Top heat	280°F
Blast pressure (lb)	18.7
Average daily scrap-free iron production (tons)	1426
Coke per ton of iron (lb)	1670
Dry flue dust (lb per ton)	80
Delays	0
Iron Analysis (%)	
Silicon	1.10
Sulphur	0.035
Phosphorus	0.300
Manganese	0.95
Btu of top gas	98
Amount of sinter	22.5
Amount of oversize ore	10

Oxygen Enriches the Blast

Results of Weirton Steel Co.'s oxygen enrichment of blast furnace air were given at a meeting of the American Iron & Steel Institute. It increases iron production

By JULIUS H. STRASSBURGER
Assistant Vice President
National Steel Corp.
Pittsburgh

FIVE YEARS ago we built a tonnage oxygen plant in the center of our steel works at Weirton, W. Va. Of the 650,000 tons of 95 per cent purity oxygen we produced, 550,000 tons were used to enrich blast furnace air.

Tonnage Increase — The use of oxygen increases iron tonnage in proportion to the enrichment of the blast. With 1.5 per cent enrichment, there is a 7 per cent increase in equivalent wind volume and a 7 per cent increase in iron tonnage.

With 2 per cent enrichment, the increased wind volume of 9.5 per cent results in a 9.5 per cent increase in tonnage. At this rate, a 76,000 cfm wind volume is equivalent to 83,300 cfm of normal air, but stack velocities are about equal to those obtained with 76,000 cfm of normal air. Table 1 (page 126) shows the enrichment of a 76,000 cfm wind volume from 0 to 3 per cent oxygen.

Enrichment—We have used up to 3 per cent enrichment. However, since we have only 400 tons of oxygen a day available for blast furnace use (daily capacity is 450 tons), we found it better to spread the supply over all the operating furnaces rather than concentrate it on one.

About 65 tons of oxygen per furnace per day is needed for each 1 per cent of enrichment. With an average of 1.5 per cent oxygen for each blast furnace, the four units have a total daily requirement of 400 tons of oxygen.

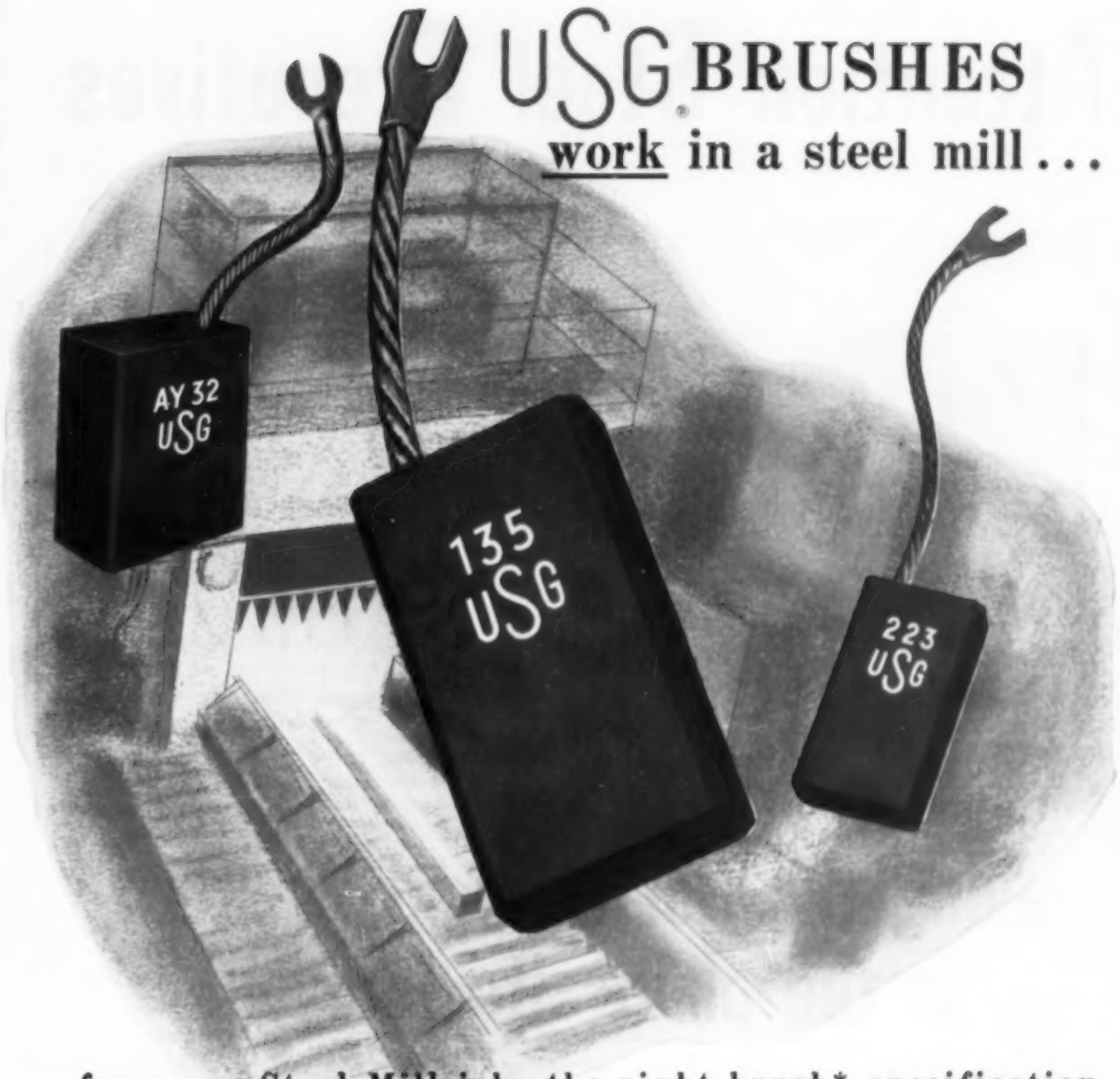
Economies — The increased tonnage with no increase in stack gas velocities gives us a proportionate decrease in flue dust per ton of iron.

With a coke saving of 25 to 50 lb per ton of iron (2 per cent enrichment), the top gas temperature is about 50°F less, cooling losses per ton are reduced and throughput is greater.

Top Gas—The carbon monoxide-carbon dioxide ratio is maintained in about the same proportion as with normal air, but the Btu of the top gas is greater because nitrogen content is less.

A furnace normally would have a top gas of about 90 to 92 Btu per cubic foot; with 2 per cent oxygen enrichment, it has a heating value of 98 to 100 Btu per cubic foot. This results in a higher gas credit to the blast furnace per cubic foot of wind blown and a more desirable heating value for boilers, stoves, soaking pits and coke ovens. Table 2 (page 126)

USG® BRUSHES
work in a steel mill...



for every Steel Mill job—the right brush* specification

THE JOB	THE BRUSH
Mill Motors	USG Grade 135
DC Crane Motors	USG Grade 223
Diesel Main Generators	USG Grade AY 32 or 2306
Diesel Switcher Traction Motors	USG Grade 2207
Welding Generators and Exciters	USG Grade AH 897
Tin Line Collector Rolls	USG Grade 1658

THE JOB	THE BRUSH
Tin Line Generators	Grade on request
Cleaning Line Generators	Grade on request
DC Generators (DC Power Supply)	USG Grade 232
AC Crane Motor Slip Rings	USG Grade 550

*All USG brushes can be obtained with STATITE®, the permanent shunt connection, needing no hammerclips; cannot be jarred loose or pulled out.

Write for your copy of the complete USG Brush Catalog.

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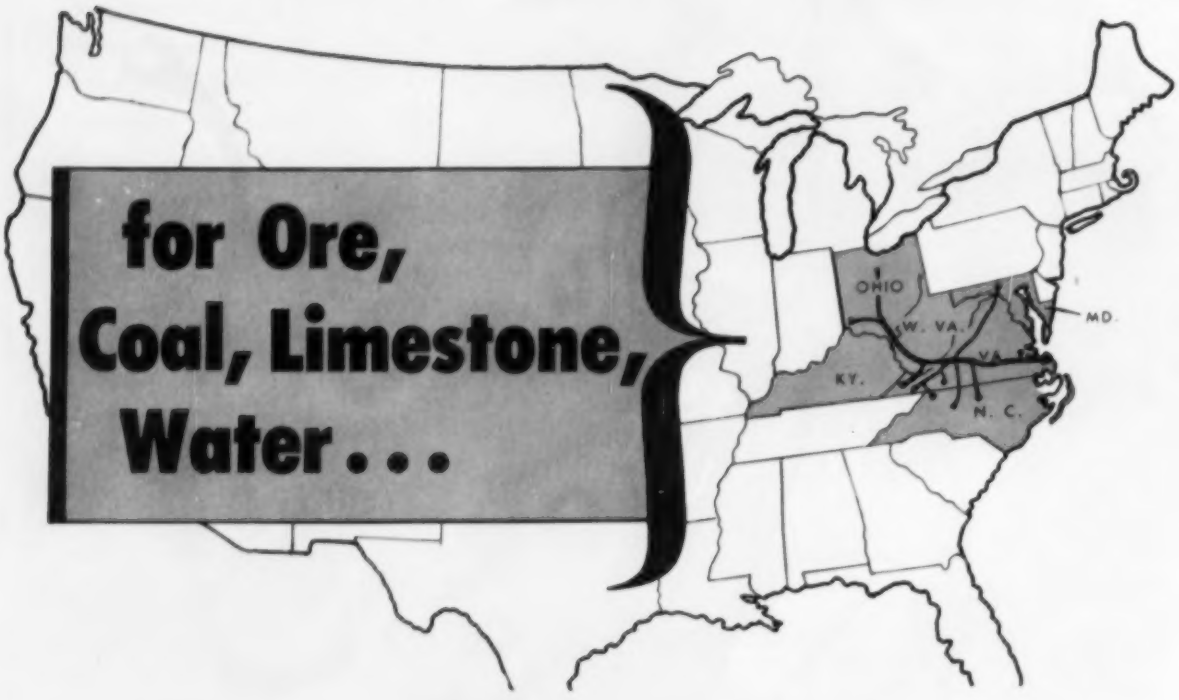
Attention Steel Executives



along the Norfolk and Western is the plant site for you!

You can build a steel mill along the N&W and be "next door" to coal and limestone. You can build directly alongside the water you need. You can avail yourself of short-haul advantages in transporting ore from the big, modern Port of Norfolk.

The coal is the world's finest Bituminous, and the supply is virtually unlimited.

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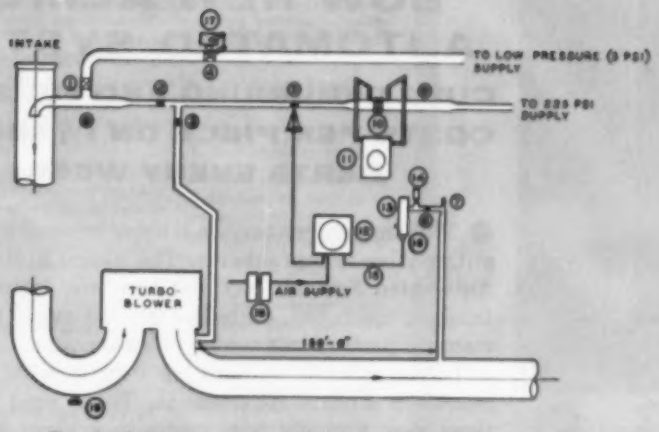


Fig. 1—Automatic system for controlling moisture content

1. Manual valve between low pressure steam system and entry pipe to the turbo
2. Manual valve between high pressure steam system and inlet to the turbo
3. Manual valve between high pressure steam system and outlet of the turbo
4. Motor operated valve to pass 5000 lb of steam an hour at 2 psig. This valve controls the amount of low pressure steam to the inlet of the turbo
5. Pneumatically operated valve used to automatically add steam to the turbo either ahead of or after, depending on how valves 2 and 3 are set
6. Manual valve to control the air sample through the dew cell
7. Manual gate valve to control the air sample bled to atmosphere for temperature control of the dew cell. Also used for blowing the dirt out of the sample line
8. Entry pipe for steam into the air intake of the turbo
9. Orifice pipe to meter the steam
10. Orifice plate
11. Flow meter for steam flow
12. Dew point recorder-controller, pneumatically operated
13. Dew cell box
14. Thermometer to measure the air sample temperature
15. Five-conductor cable which connects the dew cell to the recorder
16. Dew cell
17. Motor drive, pushbutton operated, to add low pressure steam ahead of the turbo
18. Air cleaner for instrument air
19. Drain on bottom of elbow ahead of turbo for removing condensate from the air stream

shows typical analyses of top gas with and without oxygen enrichment.

Steam Cost—Because a greater equivalent wind can be blown by oxygen enrichment, no increase in steam to the turboblower is necessary; it continues to operate at its normal wind volume. The saving of blower steam partially compensates for the steam cost of the oxygen plant.

The cost of producing oxygen is mainly steam and labor. With the 800 lb, 800°F steam supply at Weirton, about 3100 lb of steam is needed per ton of oxygen produced. The oxygen cost, including amortization of the plant, is well under $5 per ton.

Moisture Control—When we added oxygen to the blast we also installed complete moisture control equipment.

With proper moisture content, we can control the melting zone in the blast furnace to prevent sticky furnace operation and maintain a free flow of bosh gases up the stack. Fig. 1 shows the automatic control of low and high pressure steam which is introduced into the cold blast system to control moisture.

Operation—About 100 ft downstream from the turboblower, a connection on the air discharge line delivers an air sample through an insulated line to a dew cell. The cell determines the amount of moisture in the air. It is recorded on a recorder-controller in grains per cubic foot.

Any variation in the set amount of moisture needed varies the amount of steam delivered to the turboblower intake through an automatic valve in the steam lines.

Metered—Steam can be added on the suction or discharge side of the turboblower. A meter measures the steam flow as a check on the moisture control and also for accounting purposes.

Another moisture recorder measures the natural moisture in the atmosphere through a separate dew cell system. With the record of natural moisture, we have an additional check on the amount of moisture added by the controls.

Moisture Content — Normally, with 2 per cent oxygen enrichment, the moisture is controlled at

Sensational Development in Barrel Finishing...

HOW NEW ALMCO AUTOMATED SYSTEM

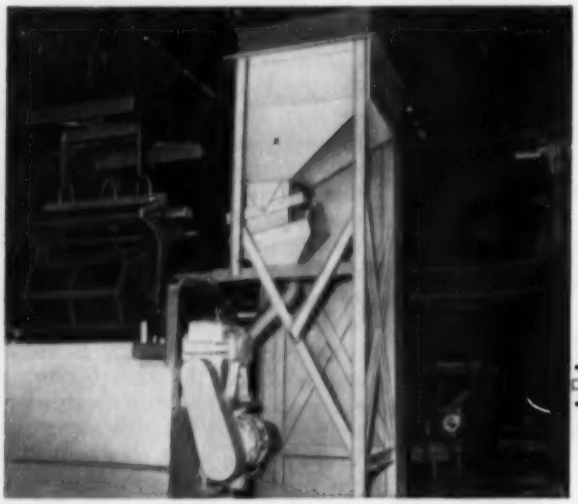
CUTS DEBURRING AND FINISHING COSTS PER PIECE ON 1½ MILLION PARTS EVERY WEEK!

● This tremendous savings is being enjoyed by a major automotive manufacturer. The Almco Sub-O-Matic Automated Systems pictured here are deburring and finishing machined, centerless ground metal parts and stamped parts to micro-inch precision.

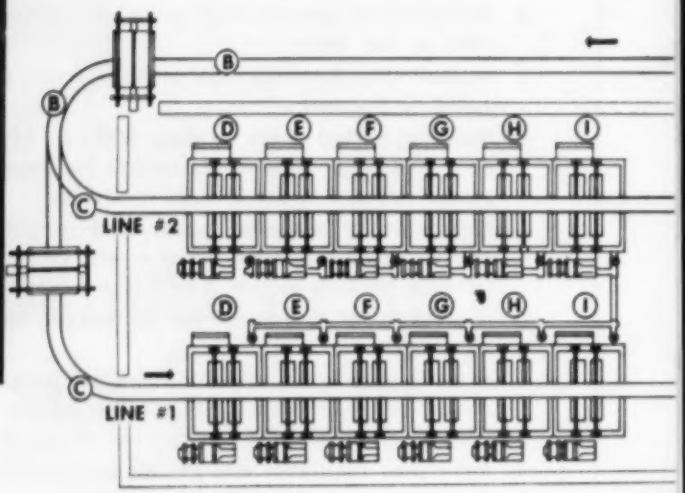
Tolerance limits on radii are ± .0005, with a 7 to 10 microinch surface requirement. These rigid specifications were formerly very costly to achieve on a mass production basis.

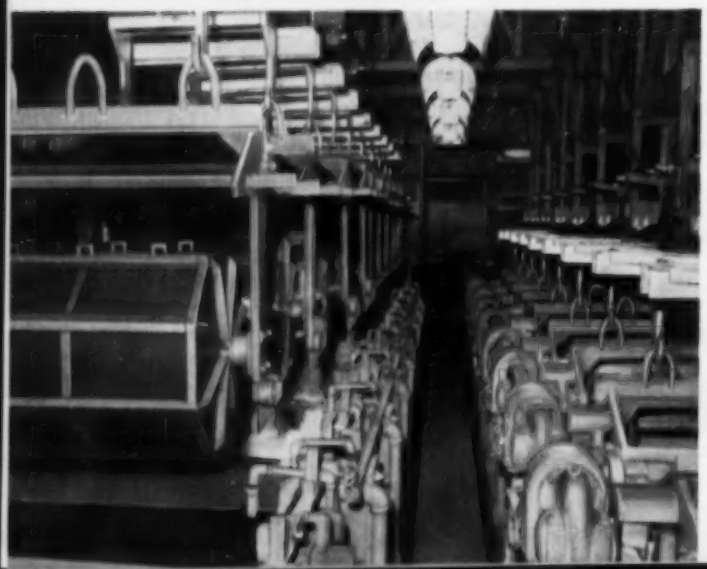
Utilizing the "submerged" type of barrel finishing, the Almco system is meeting these requirements, and cutting costs on *every piece processed*. Follow the story, and see how it's done!

a. Operator pushes a button and pre-determined amount and sizes of abrasive chips flow through a swivel-chute from an overhead storage bin into the barrel. Work parts are loaded (manually or mechanically), easy-handling door is closed, and the barrel is ready to enter the system.



b. The barrel rises automatically from the loading-unloading station and is travelled by power-and-free conveyor to head of the finishing lines. An automatic walking beam alternately feeds two submerged-type barrel finishing lines.





c. Barrels in each line index simultaneously from one tank to the next at pre-selected time intervals. Descaling, deburring, grinding, burnishing, coloring, rinsing and rust inhibiting are automatically performed in sequence. Upon completion, barrels travel to loading-unloading station.

PRODUCTION FLOW CHART

(diagram below)

Two 6-station submerged lines. The lines are serviced by automatic walking beams... each indexes six barrels every 5 minutes from tank to tank during processing cycle.

Time cycle: 30 minutes per barrel. One barrel of finished parts completed every 2½ minutes.

Barrel size: Barrels are 22" x 26".

FLOW:

A. Loading-Unloading station. Media chips are loaded into barrel by air-operated swivel chute attached to overhead storage hopper. Parts are then placed in barrel and it is ejected from station.

B. Barrels pass along power-and-free conveyor system to start of automated finishing lines.

C. Barrels alternately enter overhead walking beams over lines 1 and 2; each indexes automatically every 5 minutes.

D. First station. Degreasing tank.

E-F-G. Grinding tanks.

H. Rinse tank.

I. Rust inhibiting tank.

J. Parts and media are unloaded to belt conveyor.

K. Parts are separated from media by magnetic pulley.

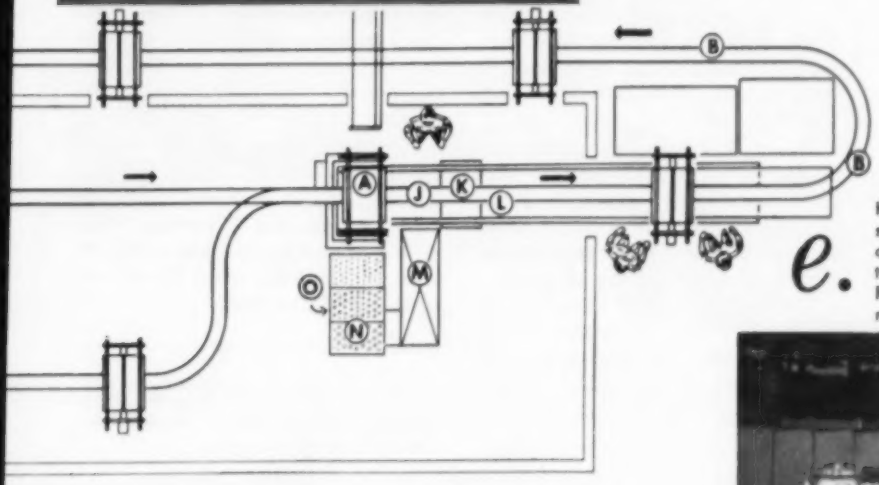
L. Pulley raises parts from conveyor where parts are "picked-off" by operators for assembly or storage.

M. Vertical boot-type elevator. Elevates chips to overhead rotary screen classifier.

N. Rotary screen classifier. Separates media chips according to size.

O. Overhead hopper. Media chips drop through classifier into separate retaining bins.

d. Every 2½ minutes in this Almco Sub-O-Matic System, a barrel of completely processed parts is unloaded. This high rate of production is actually equivalent to *one man operating 92 standard barrels!*



e. Here, a magnetic pulley separates centerless ground steel parts from the abrasive chips. Parts pass over a demagnetizing coil and are conveyed to a "pick-off" table where operators remove them for assembly. For non-ferrous parts, a vibrating screen replaces the magnetic pulley.

f. While parts journey to "pick-off" table, the abrasive chips drop from the conveyor belt into a vertical bucket elevator which lifts them to an overhead rotary screen classifier. Chips are separated according to size and are then dropped into respective bins, ready for the next loading.

In pioneering automated barrel finishing, Almco engineers have developed two basic types of Sub-O-Matic Systems, the Skip-Station and the In-Line. Many variations are possible, so that Almco engineers can match your requirements exactly. The completely equipped Laboratory at Albert Lea, Minnesota, displays operating systems for examination, and sample processing of your parts. Write today for your copy of the new Almco Sub-O-Matic Catalog!

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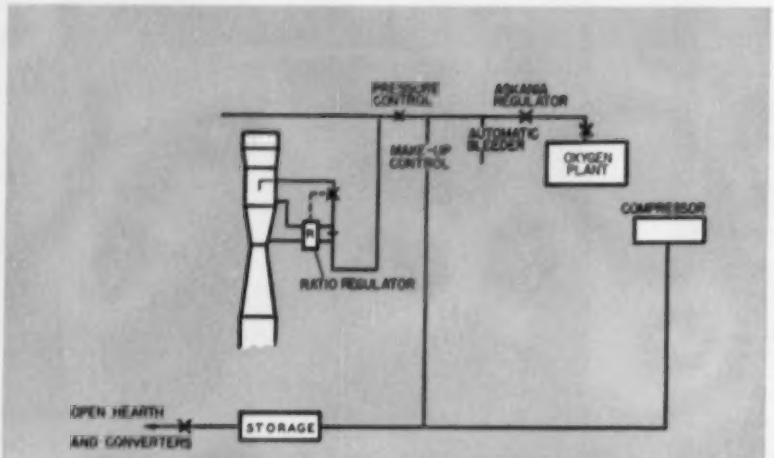

Fig. 2—Oxygen flow from oxygen plant to one of six turboblowers

OXYGEN BLAST . . .

about 7 grains per cubic foot in the turboblower discharge. The moisture content increases with the increase in oxygen enrichment. Example: At 1 per cent enrichment, moisture is maintained at 5 grains per cubic foot; at 2 per cent enrichment, moisture is kept at 9 to 10 grains.

Adding steam to the blast for moisture control also delivers hydrogen and oxygen into the blast furnace bosh without accompanying diluents, such as nitrogen. Steam contains about 89 per cent oxygen and 11 per cent hydrogen.

Cheap Oxygen — In dissociating the moisture in the furnace, about 1.13 tons of steam are required to dissociate 1 ton of oxygen, which reacts with the coke to form carbon monoxide. The hydrogen is valuable for blast furnace reduction reactions.

Steam is a cheap means of introducing additional oxygen into the furnace. With steam at $1 a ton, the oxygen delivered to a blast furnace by moisture dissociation costs only $1.14 per ton of oxygen.

Oxygen Plant—Our oxygen plant is of Air Products' design, using reversing heat exchangers of aluminum for both cleanup of air and precooling to liquefaction temperature.

The oxygen leaves the plant through an 18 in. line (see Fig. 2). An Askania regulator reduces pressure to about 2 lb. A makeup control maintains the pressure in the line by supplying makeup oxygen from a 300 lb compressor storage system.

Blower Controls — The oxygen then passes through an automatic pressure control which reduces pressure to 1 lb. The oxygen is handled through duplicate sets of controls on each of the six turboblowers.

Turboblower controls consist chiefly of a ratio regulator which controls the flow of oxygen into the blower intake in exact proportion to the flow of air through the venturi control meter of the main blower.

Furnace Linings — There has been no detrimental effect on hearth, bosh or stack linings due to oxygen enrichment of the blast. No. 1 furnace, which had a ceramic hearth, was blown out in 1953 when it produced 3,115,000 tons on its lining.

No. 2 furnace, with a carbon hearth, was blown out in the fall of 1954. It had produced 3,336,000 tons of iron. No. 3 furnace, also with a carbon hearth, had 3,493,000 tons on its lining when blown out in March of this year.

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Table 1—Equivalent Wind Volumes of Oxygenated Air

Oxygen Enrichment (per cent)	Equivalent Wind Volumes (cfm)
0.0	76,000
0.5	78,000
1.0	79,700
1.5	81,500
2.0	83,300
2.5	85,100
3.0	87,000

Table 2—Typical Analyses of Top Gas

	Enrichment	
	None	1.5 %
CO_2	14.0	15.0
O_2	0.0	0.0
CO	26.4	27.2
H_2	2.9	3.4
N_2	56.7	54.4
Btu	94.4	98.6
CO/CO_2	1.89	1.81

Alliance RUN-OUT TABLES

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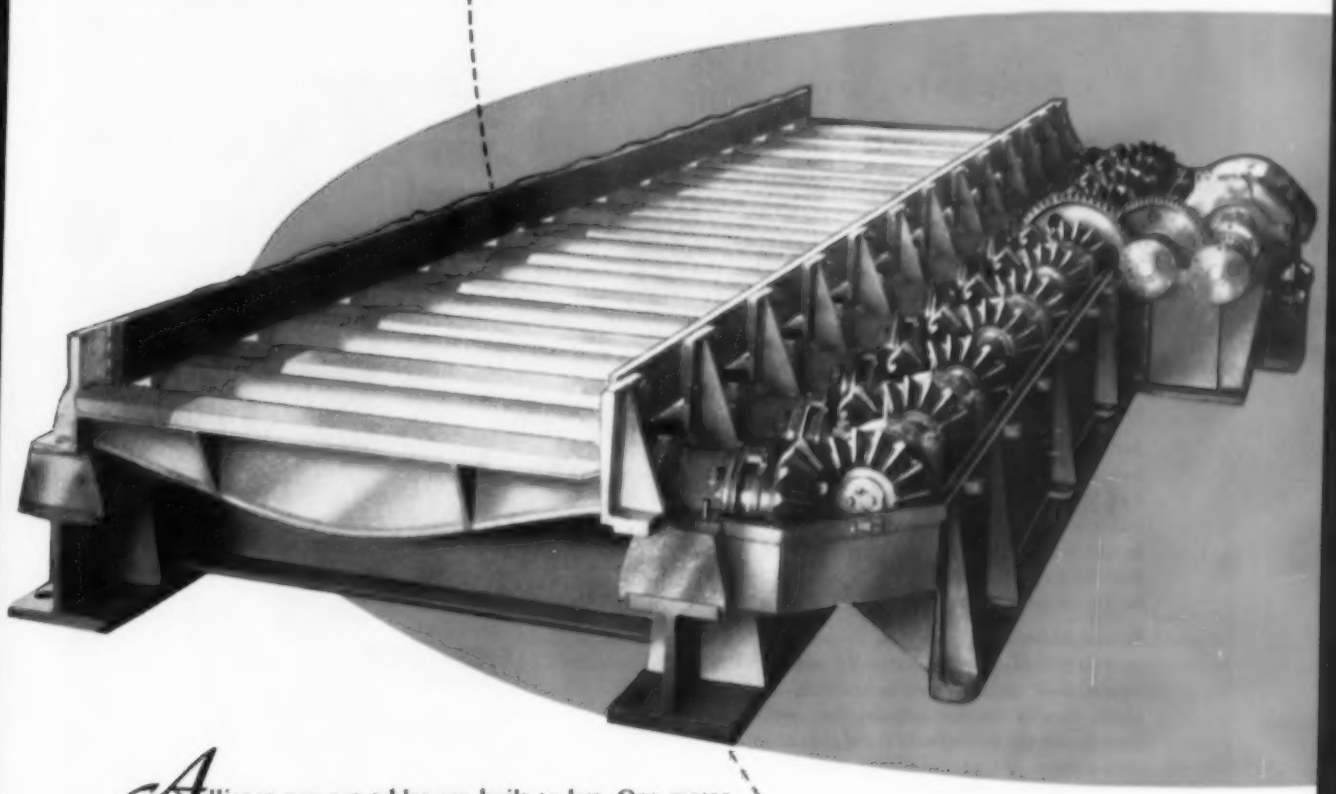

Alliance run-out tables are built to last. One motor drives all rollers, turning them at the same speed. This reduces slippage and assures smooth handling of ingots, blooms and slabs. The gears (shown exposed) driving each roll are totally enclosed and run in oil. A sealed cover keeps lubricant in and dirt out.

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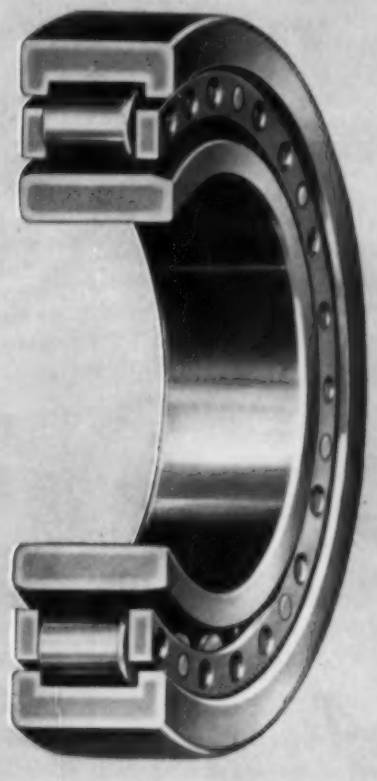

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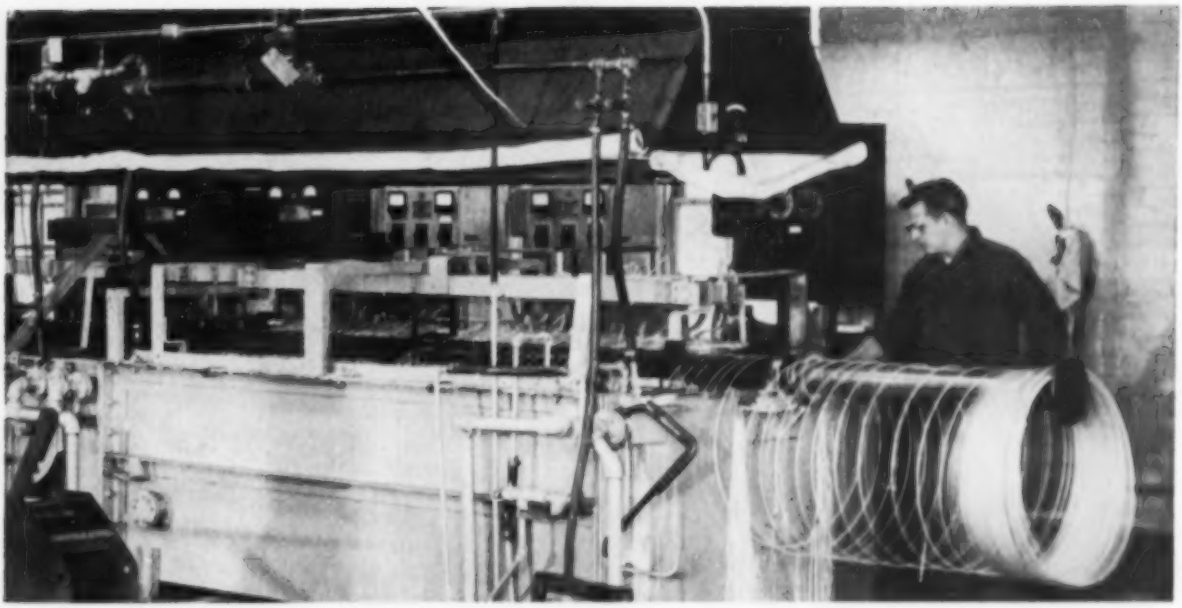


Wire collects in coils at takeup end of line

Wire Spirals Through Plating Bath

NICKEL is being electroplated on steel wire by an automatic, continuous process without intermediate deposit. Other metals, such as copper and brass, also have been electrodeposited by this method.

Significant to users of nickel and nickel-plated wire is the saving of scarce nickel promised by the process—up to 95 per cent. Fernicklon, tradename of the nickel-coated material, is produced by the improved Kenmore process at National-Standard Co.'s Niles, Mich., plant.

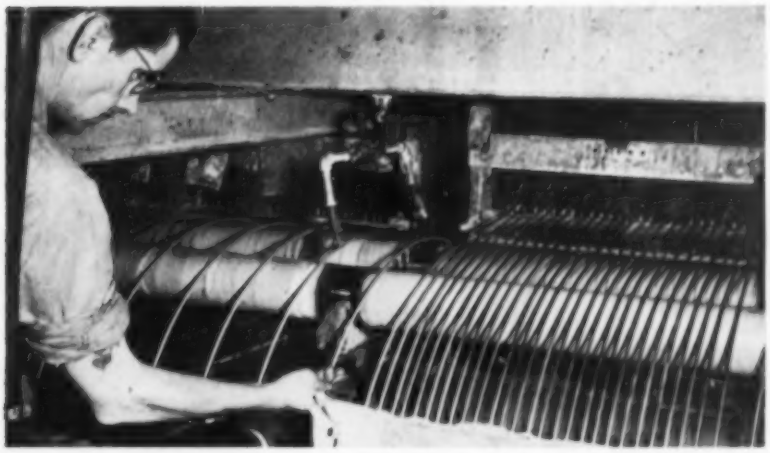
Drawing — A uniform coat of nickel is electrodeposited directly on high carbon, low carbon or alloy steel rod or wire. Then the material is drawn by conventional methods to finished size. Lack of coating rupture after reductions in area of 90 per cent without intermediate anneal indicates the nickel deposit's ductility.

Flexibility of the process makes possible coatings of up to 10 per cent nickel within narrow tolerances, even in thin coatings.

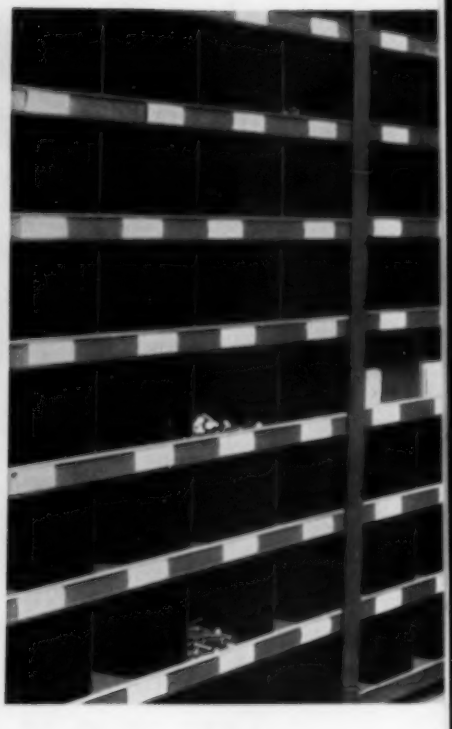
Spiral Plating — To obtain the fine-grained, ductile coatings necessary for drawing without flaking, each phase of the cleaning and plating cycle must be carefully controlled. Feeding the wire through the cleaning and plating tanks in a continuous cycle is the key.

Hot-rolled rod or wire first passes through a wire die of slightly smaller diameter, through pinch rolls for driving and then to straighteners and coil formers which give the proper cast and pitch and form a large helical spring.

Continuous — In this form, the wire is continuously transferred to a slowly rotating, rubberized, horizontal support roller which takes it through the cleaning and plating cycle. Speed of the support roller



Wire feeds through cleaning and plating baths in a continuous spiral. Note contoured contacts on wire for cathode connection in plating tank (right)



Republic Wedge-Lock Steel Shelving adjusts quickly and easily to stock changes at Sikorsky Aircraft

Parts move out of storage and into production areas *fast* at Sikorsky Aircraft Company's big Bridgeport, Conn., plant. Here Republic Steel Shelving permits a systematic arrangement of stock for immediate identification. When inventory changes occur, shelves are quickly and easily rearranged to suit new requirements. As a result, Republic Shelving never becomes obsolete.

Typical is Republic's popular Wedge-Lock Steel Shelving. Its exclusive construction forms tight, sway-proof joints, without gussets or sway braces. Shelves are free from obstructions, easy to use. A lot of inventory can be packed

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Republic Wedge-Lock is extremely versatile shelving. It not only readjusts quickly to parts inventory changes, but gains strength as the load increases. In locations where overhead space is going to waste, Wedge-Lock can be stacked high and still support tremendous weights.

in a minimum of space, saving room for wide, unobstructed aisles. Yet Wedge-Lock can be quickly changed to accommodate current needs.

Republic's Berger Division, makers of Republic Steel Shelving, has been in the business of designing and fabricating quality steel shelving for more than a half a century. We will be glad to discuss any shelving problems you might have . . . or suggest ways to step up the efficiency of your storage operation. Our storage engineering assistance is available at no obligation to you. Send coupon for more information.

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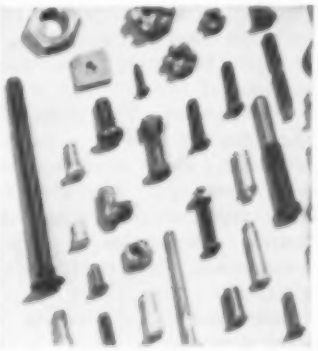

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is synchronized with the speed of the wire drive rolls.

Wire moves through the baths at a spacing of about ¾-in., depending on its size. Because of this spiral progression, the wire passes in and out of the baths several hundred times during the cycle. Contoured contacts which ride over each strand of wire where it crosses the support roll provide the cathode connection.

Coiling — The plated material accumulates on the takeup end of the line and is cut off when a coil of the desired weight collects. For long-run operations, it is collected continuously on a power-driven coiling mechanism which is synchronized with the speed of the plating unit.

National-Standard has four of the plating lines in operation, with total capacity of 34,000 amperes of connected direct current.

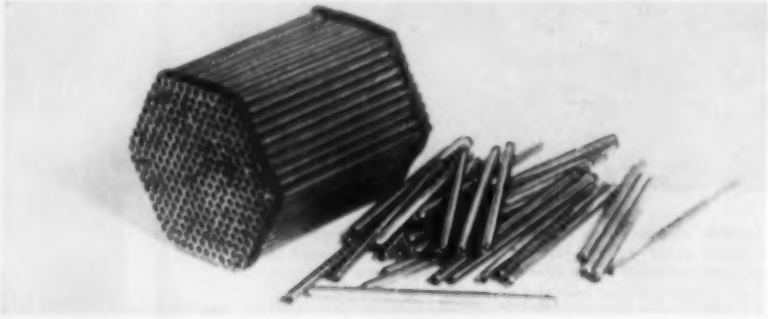
Properties — Fernicklon is produced in a matte or bright finish. Finishing operations are seldom necessary on the bright finish wire. The matte finish has a residual surface lubricant useful in some forming operations and can be burnished to a high luster.

After drawing, the wire can be annealed, shaped and worked without chipping or flaking. Such operations as bending, flattening, swaging and thread rolling are possible. The material can be spot or buttwelded if the welding time is brief (to maintain corrosion resistance at the joint).

Applications—The nickel plated wire can be used in a variety of electrical and electronic parts where strength, corrosion resistance and lustrous finish are required. Examples: Switching mechanisms for electric ranges, electronic tube grid supports, toaster guards, automotive headlight wire, lead or hookup wire and switches.

The material is particularly useful for closely coiled helical springs. By using preplated wire, the entire spring is coated uniformly; springs plated after forming do not get the protective coating where adjacent coils are close or in contact. The possibility of hydrogen embrittlement in the coating is eliminated because the plate is deposited before the wire is drawn to spring temper.

The six-sided honeycomb under the chuck is the cutting tool



Stainless tubing (2-in. lengths brazed into this shape) is the raw material for the cutting tip. The bundle is sawed in half, forming two tools, each ⅞-in. deep

Ultrasonic Machining

THE HARDEST materials give way under ultrasonic abrasive cutting: Tiny abrasive particles peck away at the material 20,000 times a second. There is no heat, noise or noticeable vibration, and only a slight pressure sinks the tool into the work.

You can use the process to produce carbide dies, sharpen carbide tools and chip breakers, make jewel bearings, emboss and engrave hard materials like crystal and jade.

Operation — The equipment resembles a drill press except that nothing rotates. Work is placed flat, and the cutting slurry (water and abrasive) is directed over it. The ultrasonic source (transducer) is attached to the cutting tool and lowered onto the work. Power is turned on, and the tool slowly sinks into the work.

The shape of the finished cut is determined by the shape of the tool. For holes, engravings and embossments, a straight, solid tool is used. For some uses, a complicated, honeycomb-shaped tool cuts a large piece into small rounds.

Transistors—Germanium is one of the metals used to make transistors. The small, round slugs are cut ultrasonically from a single, flat blank with a tool made of 271 pieces of Type 304 stainless steel tubing brazed into a hex-shaped honeycomb.

An unskilled workman can operate the Sheffield-Cavitron ultrasonic machine tool (it's made by the Cavitron Equipment Corp., Long Island City, N. Y.). There are no exposed, moving parts, no chips or turnings. Operation of the equipment is said to be entirely safe.

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Performance up to ten times the speed and four times the wear-resistance of other tools

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High-Speed Steel In machining high speed steel (207-B annealed) with hardened high speed steel tools, cutting speed was from 80 to 100 sfpm. Stupalox provided a cutting speed of 505 sfpm with .023" feed and .125" depth of cut.

SAE 1035 Steel SAE 1025 steel was cut with tungsten carbide tools at a speed of 250 to 350 sfpm. Stupalox cut the same material on the same machine at 1175 sfpm. Feed was varied from .015 to .005 and the depth of cut from .005 to .250 to demonstrate the tool's versatility.

• • •

STUPALOX is the result of thirty years of development of special-purpose oxides, by Stupakoff, one of the country's leading manufacturers of technical ceramic products. Stupalox tools are available *now*, in commercial quantities, and in a variety of sizes and shapes. Write for complete information and technical data.

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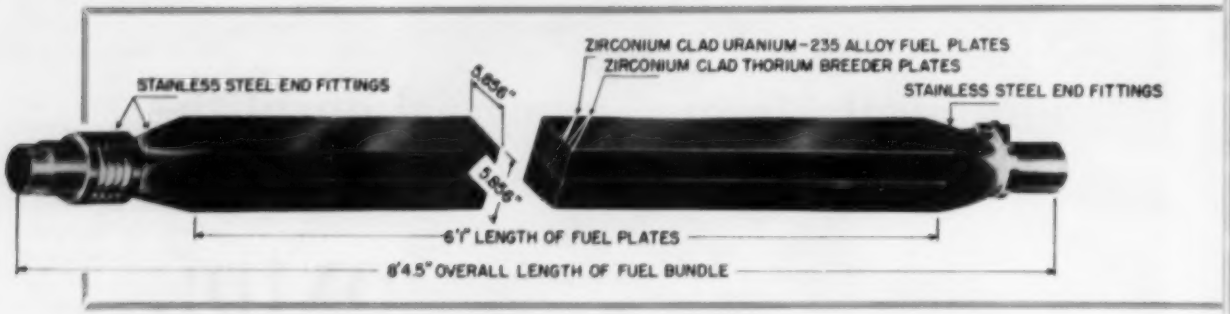

ZIRCONIUM CLAD URANIUM-235 ALLOY FUEL PLATES
ZIRCONIUM CLAD THORIUM BREEDER PLATES
STAINLESS STEEL END FITTINGS
STAINLESS STEEL END FITTINGS
5.656"
5.656"
6'1" LENGTH OF FUEL PLATES
6'4.5" OVERALL LENGTH OF FUEL BUNDLE

Many metalworking operations are involved in making this fuel element subassembly. It's an example of . . .

Commercial Atomics in Action

WHAT KIND of a plant does a company need to make (and sell) atomic fuel elements?

Take a look at Babcock & Wilcox Co.'s new, nuclear facility plant at Lynchburg, Va.—financed entirely with company money.

A 100-lb uranium-zirconium ingot (worth about $40,000) will go through a dozen machining, heating, forging, rolling and pickling operations at B&W before it becomes a finished fuel element for an assembly like the one pictured above.

Definition—A reactor fuel element is made up mostly of fissionable material, such as uranium-235, enclosed in a protective cladding. When the right number of elements are assembled in a reactor core, a critical mass is obtained.

This means a chain reaction—continuous fissioning. Energy in the form of heat is given off. What's more important is that this is a steady supply of heat which can be controlled and regulated.

A fuel element assembly may also contain a fertile material, such as thorium or uranium-238, which is converted to fissionable material while the chain reaction is taking place.

Each fuel element assembly for the nuclear steam generator which B&W will construct for the Consolidated Edison Co. of New York is a "club sandwich" of plates containing alternate layers of thorium and uranium-235.

During the chain reaction, a new fuel—uranium 233—is generated in the fertile thorium plates.

Kinds—Two major types of fuel elements are in the picture today: One is the rod or pin type. It may vary from 0.30 to 2 in. in diameter, from 4 to 10 in. in length.

The second type is the strip or plate form. It may vary from 0.01 to 0.35-in. in thickness, from 2 to 5 in. in width and may be 2 to 15 ft long.

B&W's plant was designed mainly to produce plate type elements by metal casting, rolling, welding and machining. But company officials say that the plant can be prepared to fabricate the pin or rod type.

Protects Fuel—All fuel elements made at Lynchburg will be clad with protective coatings—aluminum, zirconium or stainless steel. Cladding is a critical operation. The bond must be perfect to give good heat transfer properties needed to avoid hot spots.

The cladding does several other jobs, too: It prevents corrosion and metal distortion caused by irradiation instability and the escape of radioactive fission gases. It also confines the solid fission products within the element.

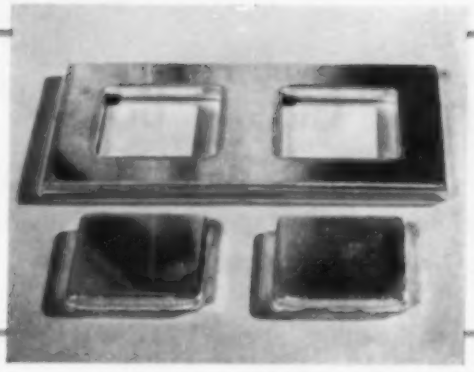
Because a defective fuel element could contaminate an entire reactor core and force a costly shutdown, the manufacturing setup at B&W is closely tied in with extremely fine tolerances and intensive inspection.

Production Steps—Let's take a look at the sequence of operations that will be used to make fuel plates for Consolidated Edison's $55-million power plant.

The reactor is known as a uranium-thorium pressurized water converter. It's the first time thorium has been used in a reactor design—some 25,000 lb will be needed.

The fuel is highly enriched uranium-235 (close to 100 per cent) which is alloyed with zirconium in a consumable electrode, vacuum arc melting furnace built by National Research Corp., Cambridge, Mass. The 100-lb ingot formed will be remelted to improve homogeneity.

Fuel Making — In the alloying process, electrodes will consist of sponge zirconium, alloying materials and U-235. An arc is struck with an electrode in the bottom of the water cooled copper mold. The



Squares of U-235 fuel, alloyed with zirconium, are punched out of rolled plate and assembled in a picture frame of zirconium for further rolling and cladding

Nuclear fuel elements and thorium breeder plates are hot and cold rolled on this close tolerance mill

electrode melts away as the ingot (4 in. in diameter) builds up in the inert argon-helium atmosphere. This ingot is used as the electrode for the remelt which produces an ingot 6 in. in diameter for further processing.

B&W also has an induction melting and casting unit at Lynchburg that can be operated in vacuum, inert atmosphere or air. It's used on certain fuel element jobs.

Rolling—After casting, the U-Zr fuel-ingot is conditioned on a 10-in. lathe. It's then sheathed in steel and heated to 1450°F for hot forging on a Chambersburg impacter to a billet for rolling.

After reheating, this billet is hot rolled on a 2 high-4 high, Farrel-Birmingham rolling mill—it's driven by two, 50 hp, direct current motors, uses 21 by 22 in. backup rolls for hot rolling and 6½ by 22 in. cold work rolls backed up by 21 by 22 in. rolls. Rolling speed can be controlled from 0 to 216 ft per minute. Direction can be reversed instantly.

After hot rolling, the steel sheath is removed. The fuel-alloy plate is cleaned by vapor blasting and acid pickling.

Punching—Next step: Cold roll to punching thickness. Core size pieces are punched from the U-Zr plate on a 160 ton press. They are assembled in a picture frame (above) made of zirconium alloy (Zircoloy-2). Sheets of zirconium alloy cladding are placed on top and bottom of the picture frame.

This assembly is again sheathed in steel and heated to 1450°F, then hot rolled to the approximate finished fuel-plate thickness.

The protective sheath is removed and the element cleaned as before, then cold rolled to final thickness (0.060-in.).

Each plate is examined in the laboratory fluoroscope. This shows up radioactive areas and permits marking for machining without danger of cutting into the hot areas.

Breeder Material—Thorium for the fertile plates comes to Lynchburg in ingots. They are heated in a salt bath to 1400°F and hot forged to billets for rolling.

Reheating in the salt bath to 1400°F follows, after which the billets are hot rolled to approximate thickness.

After cleaning by pickling, the strip is cold rolled, punched to proper thickness and width and assembled with Zircoloy-2 cladding. These assemblies are sheathed in steel, heated to 1400°F and given a moderate hot rolling.

The assembly is given a diffusion anneal in the electric furnace, followed by reheating and completion of hot rolling to approximate finished plate thickness. The steel sheath is then removed, the plate cleaned by pickling and cold rolled to final thickness (0.080-in.).

This plate is also checked on the fluoroscope for location of active material before machining to final width and length.

Assembly—Next comes the job of putting the fuel plates together. The thorium and uranium plates are positioned alternately in a jig and fusion welded. The welded assembly is given a diffusion anneal which also stress relieves the parts.

The assembly then moves to a large milling unit and is machined to final dimensions.

Stainless steel end nozzles are attached with stainless steel rivets, after which the assembly goes to the 20-in. engine lathe where end nozzles get final machining. The fuel assembly is acid cleaned, water rinsed and dried. After final inspection, it's marked with a code number.

Precautions—The uranium and other materials used in the fuel element fabrication process are not highly radioactive in the sense that they are dangerous to work with.

Special precautions are taken to avoid handling the radioactive substances and to prevent them from being taken into the body.

Ventilating and exhausting equipment continually scours radioactive particles from the atmosphere in which employees work. Individual exhausting units are provided for machines when operations are apt to develop a high concentration of radioactive material in the air.

Proof of Pudding—A critical experiment facility is operated in

conjunction with the fuel element plant. Its purpose is to check and modify the calculation of fuel element design.

B&W's atomic specialists say that inadequacies in physical data and theoretical methods prevent the reactor designer from specifying exactly the critical conditions and operating characteristics of new reactor types without making simulated tests.

The first experiment in the facility will give information needed for final design of the nuclear steam generator that B&W will build for Consolidated Edison.

In this reactor, water serves as coolant, moderator and reflector. The purpose of the water reflector is to return neutrons to the core. The water moderator slows neutrons to useful velocities. The coolant transfers heat from the reactor to the steam generators.

Transformation — Once coolant water leaves the reactor, it flows through connecting piping to the steam generators containing a large number of U-shaped stainless steel tubes. Steam generated in water surrounding these tubes goes through risers to a steam drum where it is dried by conventional steam generators. A turbogenerator then converts the steam to electric power. The primary water is pumped from the steam generator back to the reactor.

Alfred Iddles, president, Babcock & Wilcox, states that the plant has been designed to manufacture and test a broad range of present and future reactor fuel element types.

"It reflects our company's policy to develop and manufacture steam generator equipment which makes use of every available fuel, including nuclear materials.

"Many of the other B&W plants will also help in the construction of nuclear power assemblies. Taking the Consolidated Edison contract as an example, the pressure vessel will be made at our Barberton, O., works, pressure tubing in Beaver Falls, Pa., and other components will come from our plants elsewhere."

• *An extra copy of this article is available until supply is exhausted. Write Editorial Service, STEEL, Penton Bldg., Cleveland 13, O.*

Direct Current Gets a Boost

Tiny silicon rectifiers will convert ac to dc at the motor —will save running dc through a plant for one or two jobs. It's a boost for variable-speed drives

EQUIPMENT users who want to supply direct current to a handful of installations in a plant soon will have an easier time of it, says Dr. R. L. Bright, advisory engineer to Westinghouse Electric Corp.'s semiconductor department.

As he sees it, direct current motors and controllers have lagged in the machine tool field because of the impractical nature of the power supply. The same problem is met elsewhere in the shop. For example, the characteristics of a direct current motor are ideal for a crane hoist, but running high power, direct current lines through a plant solely for this purpose is too expensive.

An economical solution would be to supply alternating current to the machine and mount a rectifier at the motor. Until recently, this wasn't possible because high-power rectifiers were'nt available in small enough packages. A new silicon rectifier solves this space problem.

Miniature—Silicon has a number of advantages over selenium and copper-oxide rectifiers, according to Dr. Bright. First is the smallness of the rectifying element itself. A sandwich $\frac{5}{16}$-in. in diameter can carry 200 amperes and block 200 volts. It can be readily hermetically sealed to make it completely unaffected by humidity, fumes, oils and other plant contaminants.

A rectifier must have sufficient area to dissipate electrical losses in the form of heat without exceeding maximum permissible operating temperature. So a rectifier for a given rating can be made smaller either by reducing losses or by increasing operating temperature.

Silicon Wins—Silicon is particularly advantageous in that both of those objectives can be achieved. Losses in a 200-ampere, 200-volt silicon rectifier are only 1½-per cent of the load power as contrasted with 10 per cent for a comparable selenium unit. According to Dr. Bright, this means the silicon rectifier can be made about one-sixth the size of the selenium.

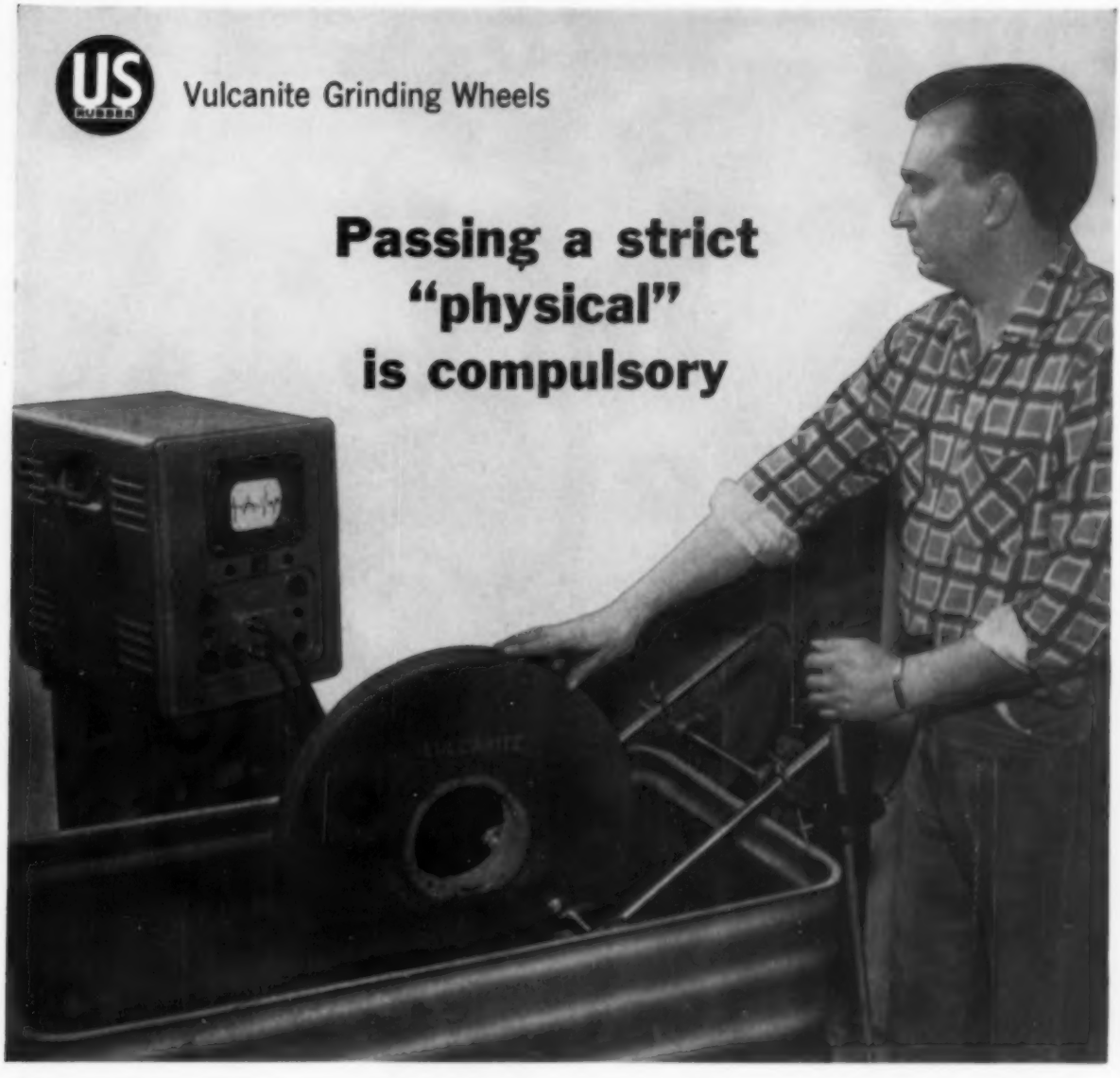
Stability — Another advantage he sees for the machine tool industry: Silicon's long term stability. Because the forward drop is constant in silicon, supply and output voltages are the same as they are at the start after several thousand hours of use.

At present, silicon rectifiers are available with current ratings from 1 to 1000 amperes and voltage ratings up to 600 volts rms. Higher ratings can be obtained on special order. Dr. Bright predicts they'll be widely used in the machine tool industry for economical direct current drives and will serve also for electrolytic machining and plating.

Hydraulic Leaks

Nothing plagues hydraulic men so much as the constant drip of precious fluid through a faulty joint. Blame for the leaks often is placed (in turn) on the machine maker, the fitting maker, the packing maker, the fluid maker or anyone else in line.

At the recent Production Machine Tool Hydraulic Forum, sponsored by Vickers Inc., Detroit, general discussion seemed to pinpoint the solution. Engineers from the machine tool builders and users alike agreed that any of the accepted commercially available fittings, properly used, would produce a leakproof joint. The problem is to get rid of leaks in those joints that have been improperly assembled.



Here's a test for internal quality

The trained technician is using an ultrasonic Reflectoscope to detect any variation in density of the inside of this U. S. Vulcanite Grinding Wheel. The latest development in the field of testing instruments, the Reflectoscope permits instant and accurate detection of any imperfections in the wheel. It is only *one* of the *many* tests "U. S." makes to insure you the grinding wheel that is *precisely* right for the job... inside and out.

United States Rubber wheel technicians know the best combination of resinoid or rubber bonds and abrasives to handle your particular job in the most economical way. Their one aim is to provide wheels that remove metal with a minimum of wheel loss and a maximum of worker's efficiency. Ask them to solve your grinding wheel problem. Write to United States Rubber, Mechanical Goods Division, Rockefeller Center, New York 20, N. Y.

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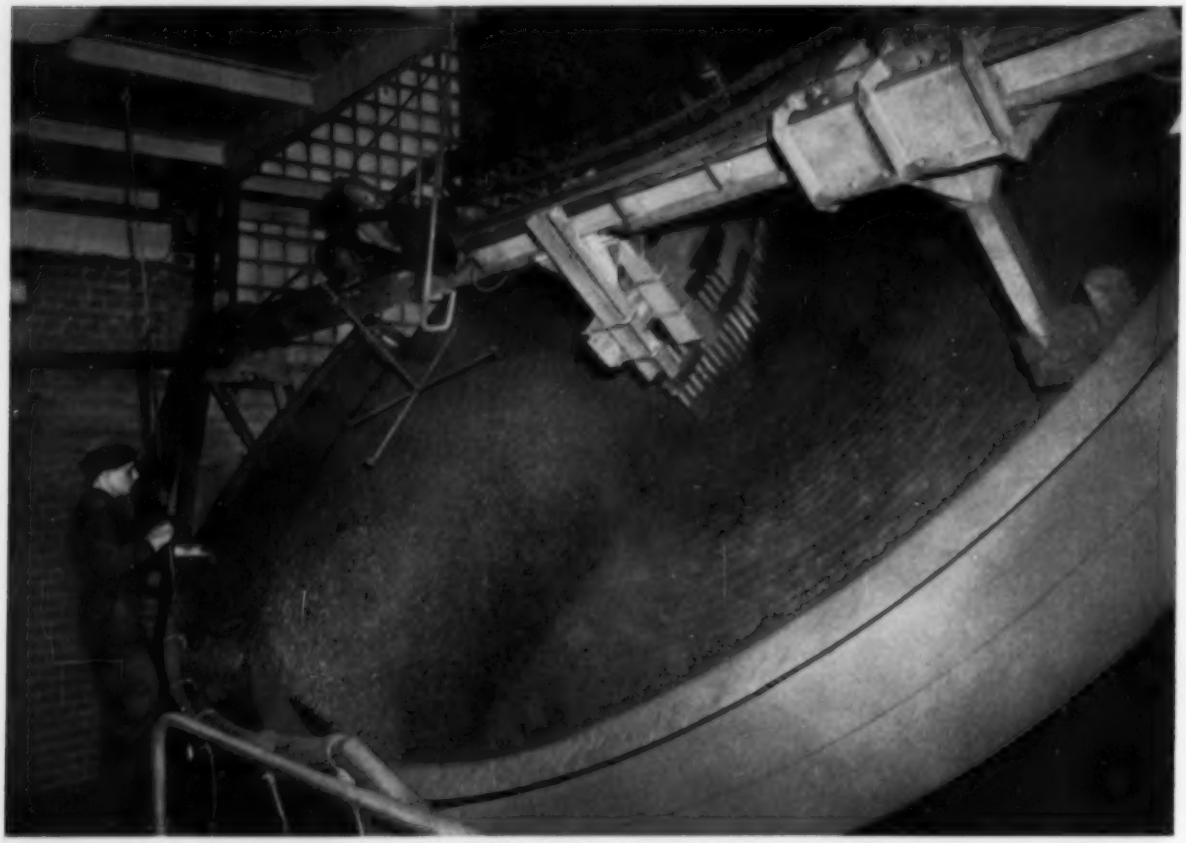


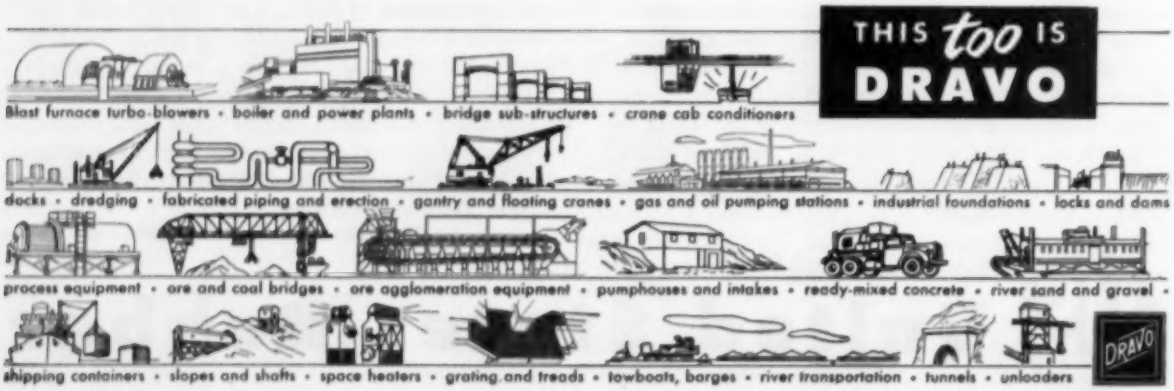
NEW WHEEL OF FORTUNE FOR THE STEEL INDUSTRY

Three of these huge tilted wheels have been installed at International Nickel Company's Copper Cliff, Ontario plant. They are pelletizing discs used with a sintering machine in a process that converts magnetite fines into a size suitable for handling in open hearth and blast furnaces.

The installation is part of a system that will recover iron content present in nickel ore and prepare a ready-to-use product for the steel industry. Dwindling American reserves of rich iron ore make even more important this method of using magnetite fines.

Developed by Lurgi, Europe's foremost designer of such machinery, this equipment is being adapted by Dravo to American standards for reliable servicing and quick delivery of parts. Inquiries are invited for technical information and design data.

For more than 60 years, Dravo has been serving business and industry in many engineering fields, with customer satisfaction considered essential in every transaction. DRAVO CORPORATION, PITTSBURGH 25, PENNSYLVANIA.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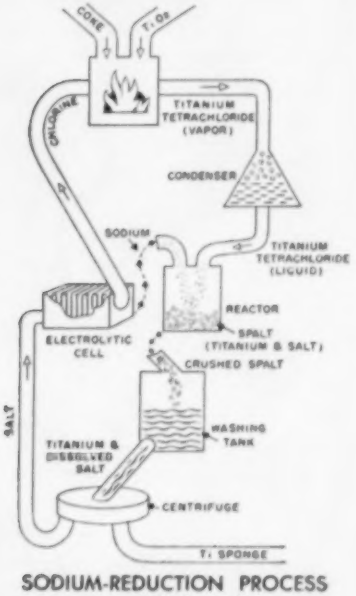
Blast furnace turbo-blowers • boiler and power plants • bridge sub-structures • crane cab conditioners
docks • dredging • fabricated piping and erection • gantry and floating cranes • gas and oil pumping stations • industrial foundations • locks and dams
process equipment • ore and coal bridges • ore agglomeration equipment • pumphouses and intakes • ready-mixed concrete • river sand and gravel •
shipping containers • slopes and shafts • space heaters • grating and treads • towboats, barges • river transportation • tunnels • unloaders
DRAVO

Titanium Progress

Production of titanium sponge by sodium-reduction caps more than six years of research

THE FIRST HEAT of titanium sponge at the new Ashtabula (O.) plant of Electro Metallurgical Co. on Apr. 26 marked the first commercial production of the metal by a method other than the magnesium-reduction process.

In Electromet's process, sodium is used to reduce titanium tetrachloride. The drawing below shows the transformation of titanium ore (TiO_2) into sponge by the sodium-reduction process. The sponge is remelted into ingots by producers of titanium mill products and commercial shapes.



SODIUM-REDUCTION PROCESS
. . . turns out high-quality sponge

Sponge Output — Titanium sponge has had a spectacular growth from a mere 3 tons in 1948 to 7200 tons in 1955, and an estimated 13,000 tons this year. The Electromet plant is expected to reach a rated annual capacity of 7500 tons by the fourth quarter of this year.

Civilian uses of titanium are expected to gain as the metal becomes more plentiful. The high strength and corrosion resistance of titanium make it particularly useful. Biggest potential markets will be in chemicals, petroleum, food, marine, electronics and atomic energy.

PRESTOLE STAKE NUTS

- **EASE and SPEED OF ASSEMBLY**
- **GREATER STRENGTH and HOLDING POWER**

. . . used in high speed assembly of metal parts and panels

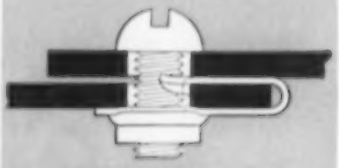
Looking for extra strength and more dependability in a fastener for metal panels and parts?

HERE'S THE ANSWER . . . the improved Prestole Stake Nut. Hundreds of fast assembly applications that are subjected to heavy service and vibration, such as automotive parts, are ideal for this Prestole engineered fastener.

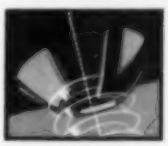
Hand applied—it quickly locks into bolt-receiving position over the panel hole, utilizing the formed catches on the lower leg of the clip. The unit is ideal for blind location attachments.

Prestole Stake Nuts are available in various multiple thread sizes and panel ranges, and in finishes to meet specifications.

1 EDGE FASTENING



2 CENTER PANEL ASSEMBLY



Creators of the famous Prestole impression "that lasts." Standard and special fasteners to meet specific requirements.

PRESTOLE Corporation
1306 MIAMI STREET, TOLEDO 5, OHIO
PRESTOLE CORPORATION OF CANADA, LTD., OAKVILLE, ONTARIO

Please send engineering application data for the following specifications:

SCREW SIZE..... PANEL RANGE ..... HOLE LOCATION .....
Application.....
Name.....Title.....
Company.....
Street.....
City.....Zone.....State.....

TRY THEM FOR HEAVY-DUTY APPLICATIONS

Fairless Works

uses

RESEARCH-COTTRELL PRECIPITATORS

for these gas cleaning jobs

Eleven Research-Cottrell Precipitators, handling 927,160 cubic feet of gas per minute with collection efficiencies of 95% and over, are installed or are being installed at U. S. Steel Corporation's Fairless Works.

Precipitators for blast furnaces and detarring are old, familiar applications for Research-Cottrell. At the end of 1955, 162 blast furnace and 464 detarring precipitators had been installed by Research-Cottrell, including these recent installations at the Fairless Works.

Scarfing and sintering machine applications are fairly recent developments, however. At present Research-Cottrell has installed two scarfing machine precipitators. Five iron ore sintering machine precipitators are in operation, and one more is under construction.

Research-Cottrell has also developed and installed precipitators for electric furnaces, ferromanganese blast furnaces and iron cupolas. For more information on any of these "steel industry" applications contact your nearest Research-Cottrell representative—or write for Bulletin GB.

Research-Cottrell, Inc.

Main Office and Plant: Bound Brook, N. J.
405 Lexington Ave., New York 17, N.Y. • Grant Building, Pittsburgh 19, Pa.
228 N. La Salle St., Chicago 1, Ill. • 111 Sutter Bldg., San Francisco 4, Cal.

RC 168

Scarfing Machines

Two precipitators clean scarfing machine gases (95,000 cfm) from a slabbing mill and blooming mill. Collection efficiency is 95%.

Blast Furnace

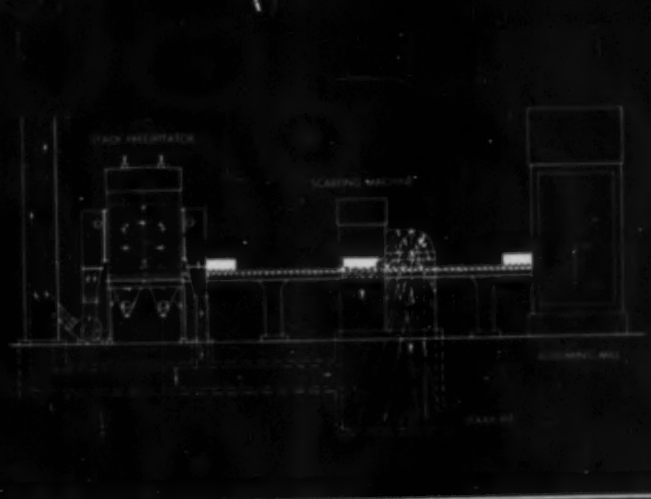
Four precipitators clean gas (330,000 cfm) from two blast furnaces. Efficiency is 95%.

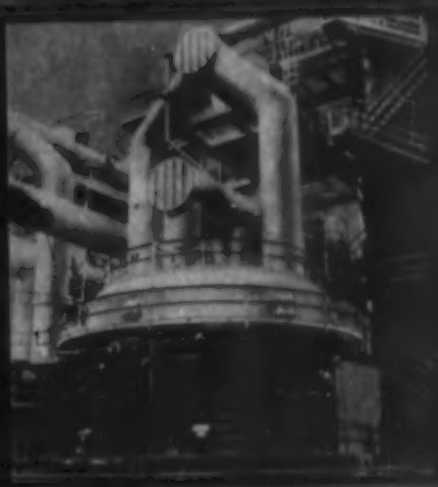
Detarring

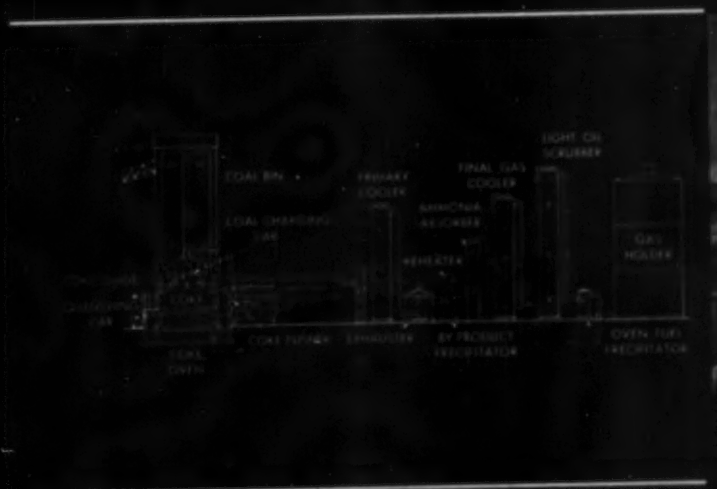
Four precipitators clean coke oven gas (62,160 cfm). Collection efficiency is 95%.

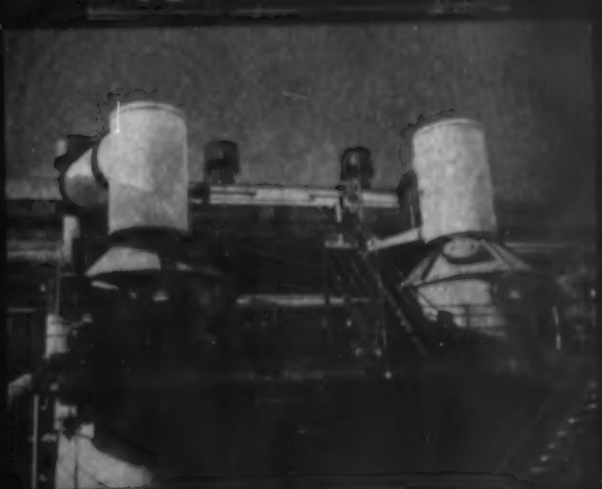
Sintering Machines

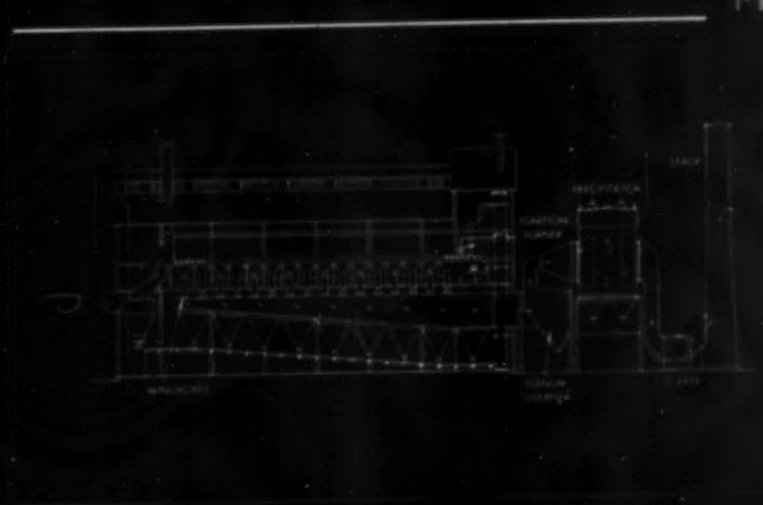
One precipitator (see cut-away drawing at right) will clean 440,000 cfm of gas from iron ore sintering machine. Collection efficiency of 95% is guaranteed.

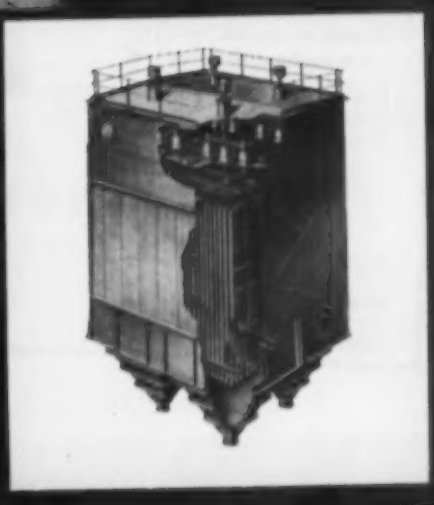





COAL BIN
PRIMARY COOLER
FINAL GAS COOLER
LIGHT OIL SCRUBBER
GAS HOLDER







NEW OAKITE CLEANERS
GIVE YOU MORE FOR YOUR
PAINT-PREPARATION DOLLAR

Here are 4 ways to end pre-paint metal-cleaning troubles

Does your trouble chart show that you need better cleaners, strippers or surface conditioners?

- ☐ Cleaning solution foams excessively in spray washing machine. See 1 below.
- ☐ Streaky discolorations or powdery residues cling to surface of steel parts being stripped for repainting. See 2.
- ☐ Zinc phosphating process too difficult to control . . . Iron phosphating process doesn't show good results in salt spray tests. See 3.
- ☐ Too many operations—cleaning, pickling, neutralizing, etc.—are needed to prepare steel that does not require phosphating before painting. See 4.

Here are brief descriptions of new Oakite materials designed to end these particular troubles:

1. For a spray washing solution that does not foam at high pressure, try Oakite Composition No. 161. Does not attack aluminum.
2. For stripping pigmented paint, phosphate coatings and undercoat rust *in one operation*, try Oakite Rustripper.
3. For a zinc phosphating process that is truly easy to control, try new Oakite CrysCoat SW . . . For salt spray results far beyond the capacity of ordinary phosphating processes, try new Oakite CrysCoat No. 89.
4. For *one-operation* removal of rust, heat scale, welding residues and light soil together with good preparation for painting, try Oakite Compound No. 131. Inhibited against attack on steel.

FREE Check the coupon and we will send you free booklets or bulletins with full information on new Oakite cleaners.

OAKITE PRODUCTS, INC.
34E Rector Street, New York 6, N. Y.

Send me free booklets or bulletins giving complete information on the new Oakite materials checked below:

- ☐ Oakite Composition No. 161
- ☐ Oakite Rustripper
- ☐ Oakite CrysCoat SW
- ☐ Oakite CrysCoat No. 89
- ☐ Oakite Compound No. 131

NAME _____

COMPANY _____

ADDRESS _____

Laminate Overlays

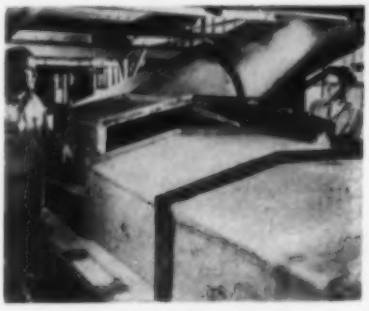
They protect products exposed to weather, abrasion, chemicals and corrosive fumes

SYNTHETIC FABRIC overlays can improve the resistance of low-pressure, glass-reinforced laminates to chemicals and abrasion.

Dynel, a fiber produced from a copolymer of vinyl chloride and acrylonitrile, is being used as an overlay on polyester laminates in boat hulls, piping, machine tool housings, laboratory trays and sinks, automobile bodies and aircraft assemblies.

Application—A polyester fiberglass laminate stack and exhaust hood at Wallingford Steel Co., Wallingford, Conn., has stood the corrosive action of hydrofluoric and nitric acid fumes for two years.

The material is used on the company's stainless steel pickling line. The light weight of the units makes them easily removable for periodic cleaning.



OVERLAID LAMINATES
. . . on pickling line at steel plant

Fabric—Synthetic fiber is made in a variety of woven and nonwoven fabrics, in various weights suitable for laminate overlays. Woven fabrics usually are used on articles subject to pulling and tugging; nonwoven fabrics usually are specified where a smooth, dense, flat sheet is required.

Glass-reinforced plastics hold paints and other finishes better when overlaid with synthetic fiber. This is an important consideration in the manufacture of plastic automobile bodies and panels.

Dynel is made by Carbide & Carbon Chemicals Co., a division of Union Carbide & Carbon Corp.

IF YOU MAKE *Springs*

YOU'LL DO BETTER WITH ROEBLING

ROEBLING makes high carbon steel spring wire and flat spring steel... and makes it *better*... for every sort of spring and for every product that requires spring characteristics. Hard drawn, hard rolled, annealed or soft, tempered or untempered ... they're all available to meet your requirements exactly.

Among these Roebling materials are zig-zag and no-sag wires; mechanical and valve spring wires; music wire; clock and motor type spring wires; flat spring steel and upholstery spring wire of all types. The variety of parts into which these are formed is almost endless, but manufacturers all report that Roebling quality and uniformity reduce machine downtime.

Learn for yourself how Roebling can help your production and product. John A. Roebling's Sons Corp., Trenton 2, N. J.

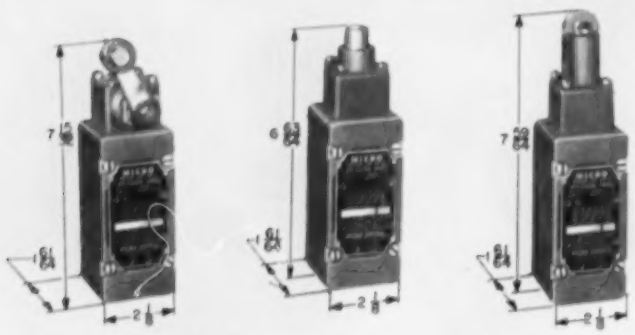
ROEBLING CFI

Subsidiary of The Colorado Fuel and Iron Corporation

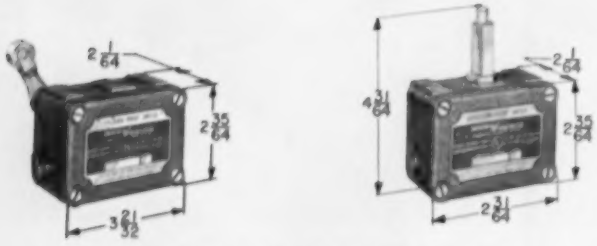
ATLANTA, 934 AVON AVE. • BOSTON, 6 LINCOLN ST. & 5 PITTSBURGH ST. • CHICAGO, 5525 W. ROOSEVELT RD. • CINCINNATI, 3253 FREDONIA AVE. • CLEVELAND, 13235 LAKEWOOD HEIGHTS BLVD. • DENVER, 4801 JACKSON ST. • DETROIT, 815 FISHER BLDG. • HOUSTON, 6216 NAVIGATION BLVD. • LOS ANGELES, 5340 E. HARBOR ST. • NEW YORK, 19 RECTOR ST. • ODESSA, TEXAS, 1950 E. 2ND ST. • PHILADELPHIA, 230 VINE ST. • ROCHESTER, 1 FLINT ST. • SAN FRANCISCO, 1740 17TH ST. • SEATTLE, 900 1ST AVE. S. • ST. LOUIS, 3001 DELMAR BLVD. • TULSA, 321 N. CHEYENNE ST. • EXPORT SALES OFFICE, 19 RECTOR ST., NEW YORK

MICRO precision switches

...THEIR USE IS A PRINCIPLE OF GOOD DESIGN



MICRO SWITCH heavy duty explosion-proof switches. Roller arm actuated (left), plunger-actuated (center) and roller plunger-actuated (right).



Explosion-proof switches with wide variety of mounting arrangements. Roller arm-actuated (left), plunger-actuated (right).

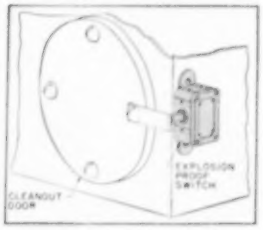
These reliable switches are insurance against many types of plant fires and explosions

MICRO explosion-proof switches are ideal electrical controls in flammable areas. They combine the ability to operate safely in explosive gas or vapor-air atmospheres with the desirable features of precise operation, accurate repeatability, small size, easy adjustment and durable construction. They are the most compact explosion-proof switches available.

MICRO explosion-proof switches are widely used in such hazardous atmospheres as those found in chemical plants, refineries, flour mills, coal mines and metal processing plants. They are Underwriters' Listed as suitable for use in hazardous locations Class I, Group C (atmospheres containing ethyl-ether vapor) and D (atmospheres containing gasoline, petroleum naphtha, alcohols, acetone, lacquer solvent vapors and natural gas); Class II, Group E (metal dust), Group F (carbon black, coal or coke dust) and Group G (grain dust).

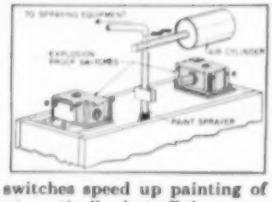
These switches are ideal components for installation on present plant equipment to make it safer, more automatic and more productive. MICRO precision switches are sold by distributors in key cities everywhere. Look under "Switches, Electric" in the yellow pages of your phone book.

As Incinerator Safety Interlock



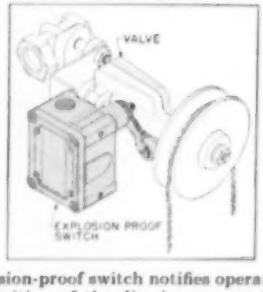
A snap-action explosion-proof switch on an oil or gas-fired incinerator prevents ignition of the fuel while the unit is being cleaned or repaired. The switch is held operated when the door is closed. Opening the door releases the switch actuator which prevents starting the ignition transformer.

Controls Automatic Paint Sprayer



Two switches speed up painting of parts and automatically shut off the spray gun at the end of each operation. When arm leaves the air cylinder, Switch "A" is released, starting the spray gun. Contact with Switch "B" turns off the spray. The painted part is removed and the operations repeated.

Control for Remote Valve



Explosion-proof switch notifies operator of the position of the disc in a remotely located valve. The valve, which contains a flammable liquid, is controlled from the floor below by means of a chain-operated wheel. The roller arm actuator is operated by the rim of the chain wheel. It is wired to a set of panel lights which indicate the disc position of the valve.

MICRO SWITCH

A DIVISION OF MINNEAPOLIS-HONEYWELL REGULATOR COMPANY

In Canada, Leaside, Toronto 17, Ontario • FREEPORT, ILLINOIS

Vacuum Remelting

More superalloys will be available this year. New capacity is going in at two plants

EXPANSION of consumable electrode vacuum remelting facilities by two steelmakers promises to bring a big boost in the production of high purity, high temperature superalloys.

Allegheny Ludlum Steel Corp. has completed a two unit melting furnace at its Watervliet, N. Y., plant. Universal-Cyclops Steel Corp. is constructing a production pilot plant at its Research & Development Center, Bridgeville, Pa.

More Coming — Allegheny Ludlum also has disclosed that it is embarking immediately on a second program which will redouble capacity. Completion is expected before the end of the year. Melting capacity then will be 1.5 million lb a month.

The company's consumable electrode vacuum remelting department went into operation in October, 1955. (STEEL, Nov. 21, 1955, p. 112.)

Development—Universal-Cyclops has been experimenting with vacuum remelting for over a year. Using a small laboratory furnace at Bridgeville, it has produced ingots up to 16 in. in diameter in co-operation with Mallory-Sharon Titanium Corp., Niles, O.

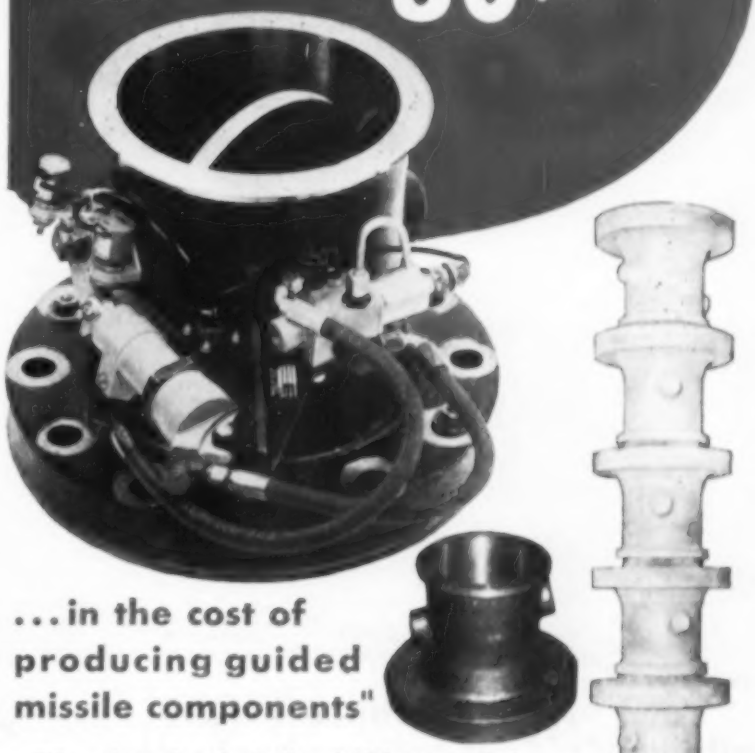
Initially, the pilot plant will melt ingots up to 20 in. in diameter, weighing about 6000 lb. In time, sufficient power will be provided to melt ingots 24 in. in diameter.

Capacity of the plant will be about 750,000 lb of ingots a month. The company expects to deliver the first material from the new unit in the last quarter of this year.

Superalloys—Improved alloys for critical jet engine and turbine parts will be the major products made by Universal-Cyclops' new process, called Duomelt. Other special alloys, such as those used in bearings, are being considered.

Remelting under vacuum removes nonmetallic inclusions and excess gases, gives better homogeneity of composition, improves workability and ingot soundness and results in a general improvement in mechanical properties.

"ESCO® SPUNCAST SAVED US 30%



...in the cost of producing guided missile components"

"Heavy butterfly valve bodies of AISI type 304 had previously been fabricated, a time and money consuming operation. Costs had to be cut, yet government specifications had to be maintained. Then we discussed our problem with an *ESCO* Engineer.

"Today, by taking advantage of *ESCO* multiple-unit centrifugal casting technique (SPUNCAST®) we are able to effect an overall saving in time and material amounting to 30% of our previous costs," says top engineer of Interstate Engineering Corporation, leading missile component manufacturer at El Segundo, California.

Whether your problem is one of heat, corrosion, impact, abrasion or alloy availability, the *ESCO* Engineering staff will help you plan for greater savings in time, material and money.

ESCO Spuncast® multiple casting "stick" technique produces six butterfly valve bodies at one time. After parting from the "stick" each valve body weighs approximately 180 pounds as cast.

ELECTRIC STEEL FOUNDRY COMPANY

ESCO

Manufacturing Plants
2160 N. W. 25th Ave., Portland 10, Oregon
1017 Griggs Street, Danville, Illinois

ESCO International — New York Office
at 420 Lexington Ave., New York City, or Portland Manufacturing Plant

Other Offices and Warehouses
Los Angeles, San Francisco, Calif., Seattle, Spokane, Wash., Houston, Texas, Eugene, Oregon, Salt Lake City, Utah, Honolulu, Hawaii

In Canada, ESCO Limited
Vancouver, B. C., and Toronto, Ontario

THILCO

BLACK

POLY·KRAFT

NEW "Black Magic"
FOR EXTRA PROTECTION AGAINST
WEATHER AND LIGHT RAYS!

ONE OR TWO SIDE COATED OR LAMINATED

These "PLUS" advantages are yours with THILCO BLACK Poly-Kraft

- RESISTANCE TO WEATHER
- RESISTANCE TO ALL LIGHT
- RESISTANCE TO WATER
- RESISTANCE TO WATER-VAPOR
- RESISTANCE TO GREASE AND OILS
- NON-TOXIC, ODORLESS AND TASTELESS
- RESISTANCE TO CREASING FAILURES
- RESISTANCE TO FIBRE RUPTURE
- STABILITY UNDER HIGH HUMIDITIES
- FLEXIBILITY AT TEMPERATURES TO -60°F.
- RESISTANCE TO ALKALIS
- RESISTANCE TO ACIDS AND ALCOHOL
- HEAT SEALABILITY

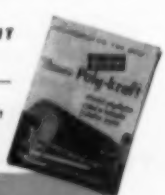
Another Thilco "FIRST"
with hundreds of end-use applications

Here's tough, durable kraft paper with BLACK polyethylene added to provide the best *weather resistant* protection yet! This latest of Thilco "firsts" embodies all the characteristics of clear Poly-Kraft with these *plus* advantages—Its black color absorbs the destructive ultra violet rays of the sun so strength of the paper combination is retained 2 to 4 times longer. And, because BLACK Poly-Kraft absorbs all wave lengths of the entire visible spectrum it provides an excellent light barrier where maximum opacity is required.

Thilco BLACK Poly-Kraft with its superior *weathering* qualities is "tailor-made" for such protective jobs as curing concrete; making temporary shelters; safeguarding sensitized papers; wrapping nursery plants and shrubs; covering and wrapping steel and metals, dried lumber, hygroscopic materials and numerous other products that *require protection from moisture, sun or light.* BLACK Poly-Kraft is obtainable in most any grade of base kraft and base paper combinations that Thilco offers. Get details today.

WRITE FOR SAMPLE KIT

It tells all about these new "Black Magic" Thilco papers — contains samples of several of the most popular plain Kraft and TufWet creped grades.



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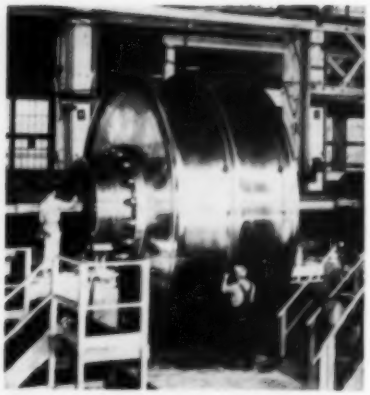


Rotor for Wind Tunnel

This 18-ft compressor rotor, the largest of its type, will be installed in the Air Force's new propulsion wind tunnel, Tullahoma, Tenn. Built at the Pacific Coast plant of Westinghouse Electric Corp., Sunnyvale, Calif., the 130-ton rotor is made up of three giant discs separated by spacers. When the 1200-lb blades are added to the discs, the rotor will weigh 180 tons, be 30 ft in diameter

Smoother Ride

PLASTIC inserts may eliminate lubrication in tomorrow's automobile suspension joints. A woven fabric, made of Du Pont's Teflon, can be molded and will withstand heavy loading without failure. In addition, the plastic reduces friction more than 50 per cent under the standard for today's lubricated suspension joints.

Developer — Most of the effort to introduce the material has been carried out by the American Metal Products Co., Detroit. It has been concerned so far with only front and rear suspension joints.

To make a bearing insert, Teflon (tetrafluoroethylene) fibers are double woven with a backing of nylon or cotton. This fabric is laminated with a cotton reinforced phenolic resin and molded into a cup to fit the bearing.

After assembly, the joint is sealed. Preliminary tests indicate that the bearing will last the life of the car without maintenance. In addition, the plastic bearing will cost no more than present types.

Other applications include: Seals, bushings, piston and sleeve bearings; propeller shaft and steel roller mill bearings; and flat sliding parts, like slider beds for adjustable seats and conveyor belts.

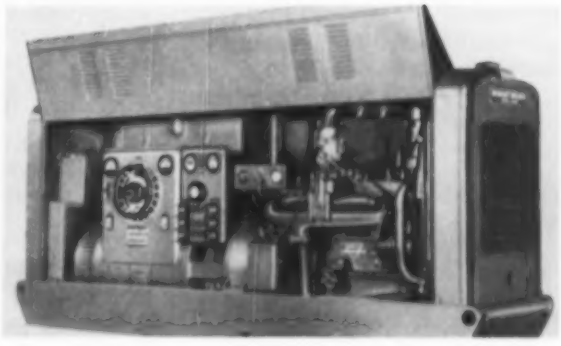
Direct Current Arc Welder Provides Auxiliary Power

A gasoline engine drives this welder. It comes in 300-and-400-amp sizes, with a choice of 6 or 12 kw auxiliary power (alternating current).

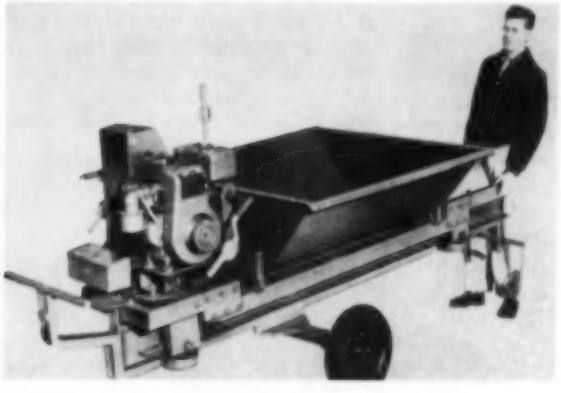
The full capacity can be used to provide 110 or 220 volt power service, or the capacity can be divided between the two.

The welding control panel has a current range handwheel, a volt-ampere adjuster and welding cable connecting studs.

Combined loads when welder and power generator are used at the same time are 18 kw for the 300 amp model, 24 kw for the 400 amp model. *Write*: Hobart Bros. Co., Hobart Square, Troy, O. *Phone*: 2-1223



Portable Bulk Material Mover Rides on a Single Rail



Unattended, the Rex Railporter follows a rail to its destination where it stops automatically. Workers discharge the hopper, engage the clutch and the unit returns automatically for another load.

Rollers which ride the sides of the single rail keep the Railporter stable. Rails come in 4, 6 and 12-ft sections, supported at each joint by adjustable stands. Two men can set 100 ft of track in 20 minutes. A carrier (shown in the photograph) brings the unit to the job site.

Carrying capacity of the hopper is 1400 lb or 13 cu ft (level). A 6 hp gasoline engine drives the unit at better than 300 fpm. *Write*: Chain Belt Co., 4600 W. Greenfield Ave., Milwaukee 1, Wis. *Phone*: Evergreen 4-3000

Surface Grinders Have Increased Stock Removal Rates

Models 24 and 36 of the vertical rotary surface grinders have been redesigned to work to closer tolerances.

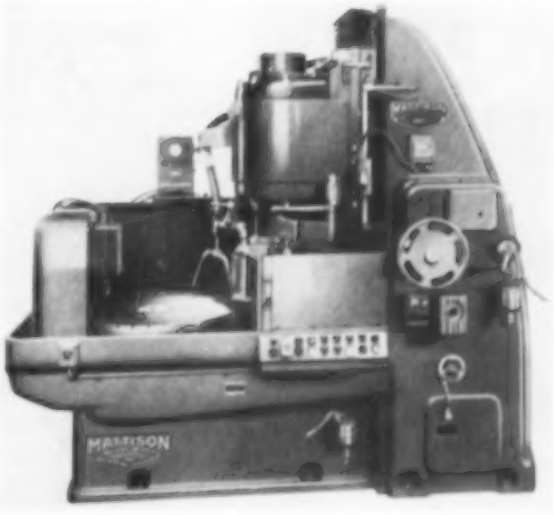
A continuous down feed system eliminates the mechanical linkages of ratchet-type feeds and increases the range of feeds.

On many jobs, horsepower and wheel capacity are the only factors limiting the feed rate.

The coolant tank is separate from the machine so that changes in coolant temperature do not affect accuracy.

Standard equipment on Model 24: A 30 in. magnetic chuck and an 18 in. segmented wheel. Model 36: A 36 in. magnetic chuck and an 18 in. wheel. A 40 hp spindle motor is used on Model 24, a 50 hp on Model 36.

Ways of the column and base are protected at all times. *Write*: Mattison Machine Works, 545 Blackhawk Park Ave., Rockford, Ill. *Phone*: Rockford 2-5521



NEW PRODUCTS and equipment

Sand Muller

This shell molding unit rapidly and thoroughly coats or blends dry sands with dry or liquid phenolic resins.

Compressed air introduced through a blower dries the materials after the sand is coated with resin. A bottom door discharges the sand.

The mullers have capacities of 125, 300 and 1000 lb. They can also be used for mixing oil sands or green sand facings. *Write*: Shallway Corp., Ninth & West Crawford, Connellsville, Pa. *Phone*: 895

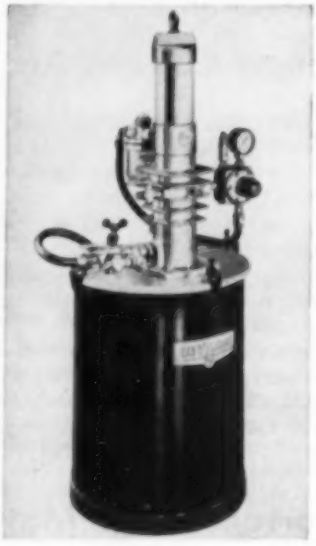
Corrosion Resistance

ChromiCoat is a conversion coating for aluminum and zinc designed to meet specification MIL C-5541. It increases corrosion resistance and improves paint adherence by reducing chipping and flaking.

The coating is used in concentrations of 2 to 3 ounces per gallon of water at temperatures up to 100°F. *Write*: Oakite Products Inc., 134E Rector St., New York 6, N. Y. *Phone*: Whitehall 3-0940

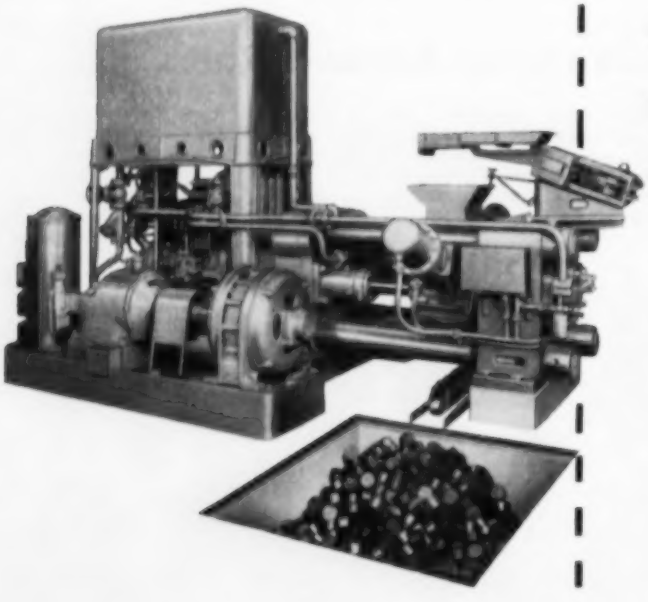
Paint Pump

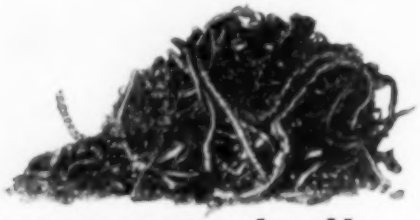
Pump P-QBF can supply up to 18 spray guns with more than 1 quart of paint a minute. It is operated by compressed air. Delivery pressure is about 200 lb when the compressed air supply is 100 lb.



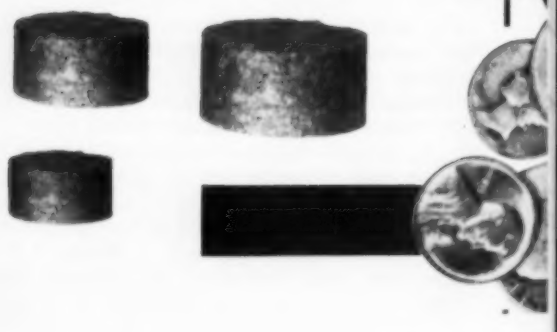
Models of the pump are made to fit user's needs. The pumps will handle material directly from a 55 gallon drum. Frequent refills are eliminated and spillage and wasted material are reduced. One

this
"metal-working mint"





converts bulk
machine tool scrap
into briquettes



model is built with a 10 gallon hinged-lid tank.

The pump automatically speeds up or slows down to compensate for variation in the material used.

It has a controlled by-pass to recirculate materials. This gives a more uniform delivery pressure and keeps materials well agitated. *Write*: DeVilbiss Co., 300 Phillips Ave., Toledo 1, O. *Phone*: Kingwood 5411

Positioning Table

With this table, production drilling is quick and accurate (within 0.001-in.). It can be mounted on any drilling machine and is easily changed from job to job.

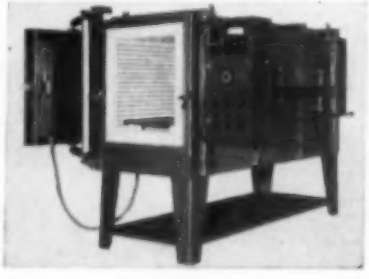
The movable portion of the table rides freely over a predetermined area on ball thrust bearings. A removable hole location plate carries the pattern.

To move from one hole center to another, the operator depresses a lever and slides the movable portion of the table to the approximate hole center. The locking mechanism automatically pulls the

table into correct alignment. *Write*: Howe & Fant Inc., 20 Fitch St., East Norwalk, Conn. *Phone*: Temple 8-3448

Heat Treating Furnace

Six temperature zones are provided. Heat in each zone is controlled by an input controller which may be set from 7 to 100 per



cent of input (in readings of 1 per cent).

Any rate of heating-up time may be selected to control product uniformity. Working dimensions are 72 x 24 x 24 in.

Elements are supported by special holders with excellent heat transfer properties. A low mass characteristic keeps overshoot and undershoot of the temperature control point to an absolute minimum. *Write*: L & L Mfg. Co., 136 Eighth St., Upland, Chester 100, Pa. *Phone*: Chester 2-5164

Office Automation

A new method of housing and indexing strips of perforated paper tape and edge-punched cards saves time in common-language data processing operations.

It's an adaptation of Kardex—the standard-size pocket can hold both 5 and 8-channel tape. The tape is fitted into a holding card

and extra profits ...automatically!

MILWAUKEE BRIQUETTING PRESSES INCREASE SCRAP VALUE $20.00 PER TON . . . OR MORE . . . by converting bulk borings, turnings and chips into briquettes. Classifying as high-grade scrap, briquettes are small, dense and uniform in size . . . eliminate scrap handling problems . . . require minimum storage space per ton . . . assure a more profitable operation for high-production metal-working plants of all types.

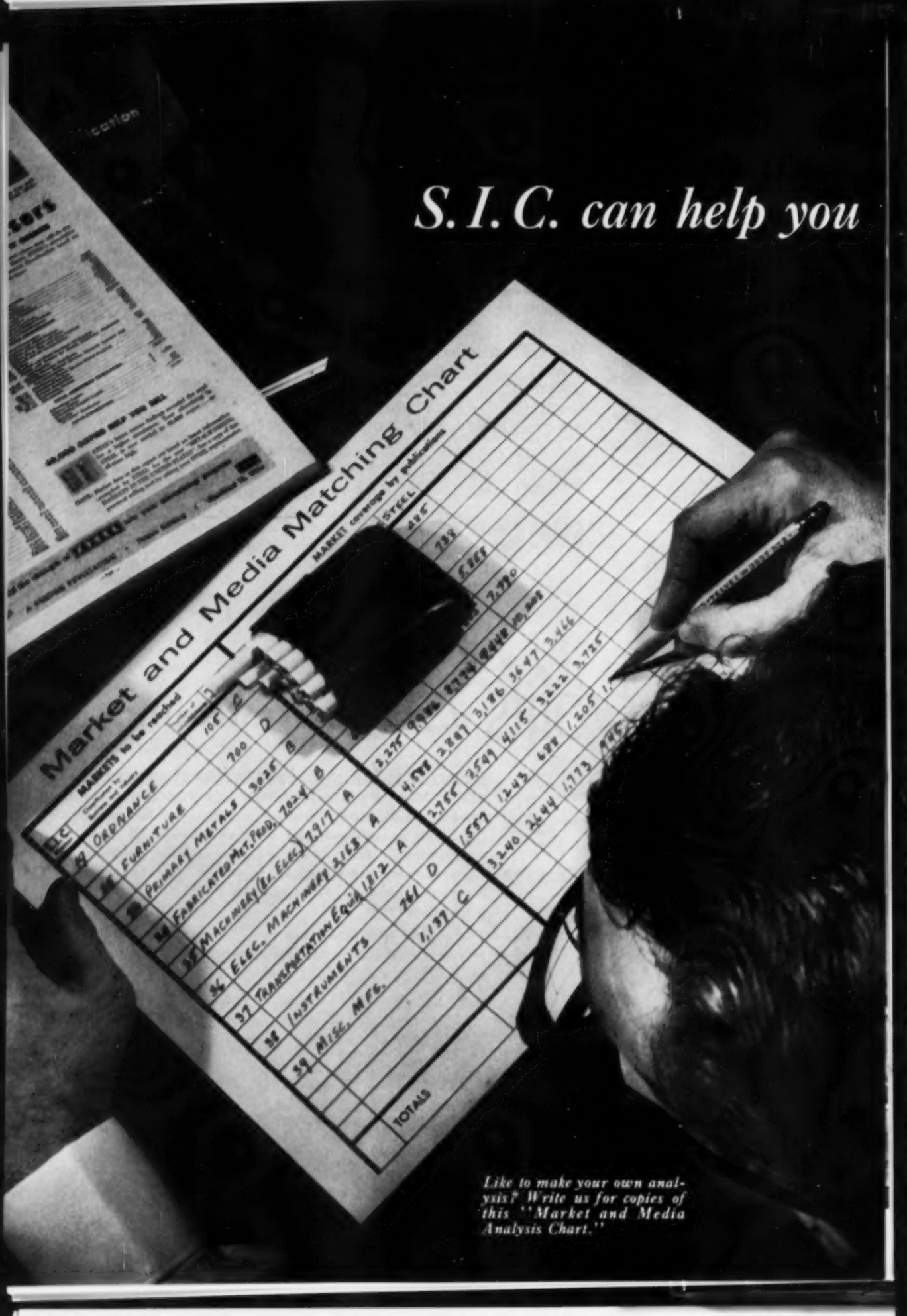
Six models of these automatic hydraulically-operated presses are available. Capacities range from ¾ to 3½ tons per hour.

FOR DETAILS AND PRICES, WRITE FOR BULLETIN 117.

SPO

MILWAUKEE Foundry Equipment Division

6494 GRAND DIVISION AVENUE
CLEVELAND 25, OHIO


S.I.C. can help you
Market and Media Matching Chart
MARKETS to be reached
MARKET coverage by publications
STEEL
SIC
ORDNANCE
FURNITURE
PRIMARY METALS
FABRICATED MET. PROD.
MACHINERY (EX. ELEC.)
ELEC. MACHINERY
TRANSPORTATION EQUIP.
INSTRUMENTS
MISC. MFG.
TOTALS
Like to make your own analysis? Write us for copies of this "Market and Media Analysis Chart."

to match media to markets

How often, in buying business paper space, have you wished for some method of matching circulation to your market?

. . . Or a simplified, fast way of finding out what proportion of the worthwhile establishments and buying power you were reaching with a publication?

One advertiser calls it, "Taking the hocus-pocus out of circulation".

You can do it with S.I.C.—combined with the Penton Census. Reporting on the Standard Industrial Classification basis is distinctly a PENTON development—and a vital part of the Census Operation.

Take STEEL Magazine, for instance. When you look at the circulation analysis, you'll see how we've already matched circulation to the market for you. To help you quickly find out how we stack up, you can run your eye down the plant counts, and compare the coverage figures for every product category. You can readily see what proportion of the worthwhile establishments you're reaching.

You'll find similar information available on each Penton publication, to aid you in Media Selection.

This method of matching media to the market is made possible through the use of S.I.C. and the Penton Census. It's just one of the advantages of doing business with Penton.

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When welding stainless...and corrosion resistance is a "must"

WELD WITH ARCOS

STAINLESS ELECTRODES

Welds on a catalytic cracking unit such as this are continually subjected to corrosion, pressure and high temperatures. They must be perfect—faulty welds will result in failure and costly downtime. That's why it pays to specify ARCOS Stainless Electrodes. Quality controlled in manufacture, they assure sound weld metal for long-term dependability under continual use and the severest conditions. ARCOS CORPORATION, 1500 South 50th Street, Philadelphia 43, Pa.

NEW PRODUCTS and equipment

in the Kardex pocket, and the coded information is printed on the body of the holding card for identification. *Write*: Remington Rand, division of Sperry Rand Corp., 315 Fourth Ave., New York 10, N. Y. *Phone*: Spring 7-8000

Strapping Sealer

A sealer weighing less than 3 lb is fast and easy to operate when strapping close to a conveyor top or the floor. The bottom handle of the pump-type unit rests against the object being strapped. The sealer makes a multicut joint.

Models are available for ⅜, ½, ⅝ and ¾-in. straps. All operate at 90 degrees to the strap. *Write*: Brainard Steel Division, Sharon Steel Corp., Griswold St., Warren, O. *Phone*: 2154-1

Blowpipe

Light gage sheet to 8-in. slabs can be cut mechanically by this new blowpipe. Cutting nozzles are available for use with oxyacetyl-

ene, oxypropane and oxymethane.

The blowpipe can be used with any machine carriage equipped with suitable blowpipe rigging. It is for continuous or intermittent straight line, bevel and circle cutting operations.

A rotary oxygen valve operates smoothly without jarring the blowpipe when cuts are started. *Write*: Linde Air Products Co., division of Union Carbide & Carbon Corp., 30 E. 42nd St., New York 17, N. Y. *Phone*: Murray Hill 7-8000

Liquid Core Paste

Fastick has high tensile strength, low gas evolution, is fast drying and comes in ready-to-use packaging. It can be used with "D" process and shell mold halves, as well as with resin bonded and conventional sand cores.

The product is viscous and can be left standing for weeks with no indication of separation. *Write*: Frederic B. Stevens Inc., 1800 18th St., Detroit 16, Mich. *Phone*: Tashmoo 5-0725

Oil Gun

A hand operated, high pressure oil gun fits standard lubrication fittings. It gives positive pressure lubrication with oils, as well as flushing and cleansing bearings which need periodic applications of fluid lubricant.

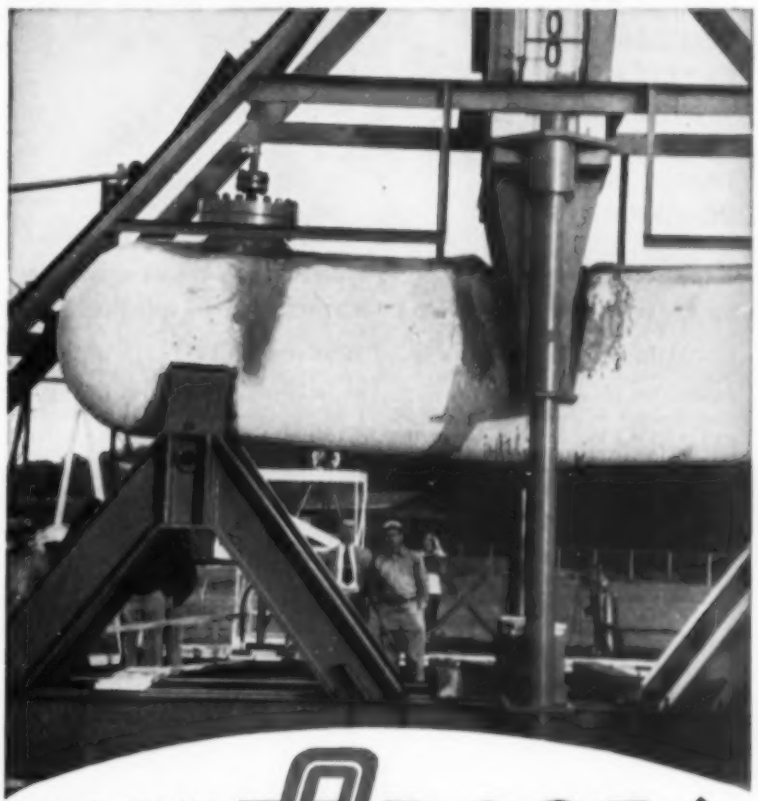
Metal rings anodized in different colors are used with the gun. The rings are slipped over the head of each fitting to provide a color coding system. In addition, they prevent the accidental use of a grease gun. *Write*: Lincoln Engineering Co., 5702-33 Natural Bridge Ave., St. Louis 20, Mo. *Phone*: Evergreen 3-5900

Coolant Pump Motor

This totally enclosed, fractional-horsepower motor is designed for machine coolant pumps. It can be mounted horizontally or vertically.

Smooth contours make it easy to keep the motor free of metal and dirt particles. Conduction and radiation cool it effectively. Internal fans keep temperatures even by

Proof of how to weld Constructional Alloy steels for maximum strength

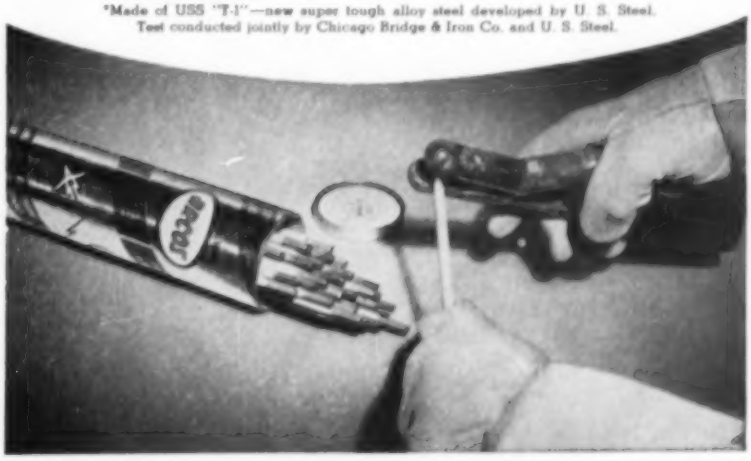


WELD WITH ARCOS

LOW HYDROGEN ELECTRODES

The above test vessel* was welded with ARCOS Low Hydrogen Electrodes without stress relieving. After being refrigerated to −33°F, and pressurized to 1,875 p.s.i., a 13-ton ingot was dropped on it from 73 ft. All steel and welds remained intact—proof of how Arcos weld metal can meet the severest requirements of strength, low temperature impact, and pressure. ARCOS CORPORATION, 1500 South 50th Street, Philadelphia 43, Pa.

*Made of USS "T-1"—new super tough alloy steel developed by U. S. Steel. Test conducted jointly by Chicago Bridge & Iron Co. and U. S. Steel.



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CONVEYING and
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SYSTEMS
TO MEET
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PLANT
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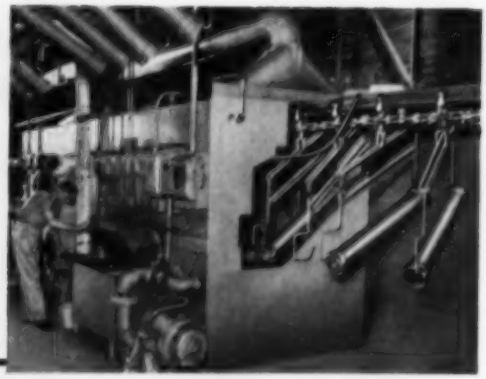

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52 Years making quality punches and dies. Our many customers throughout the nation repeat year after year because they know they can rely on our tools for consistent performance.
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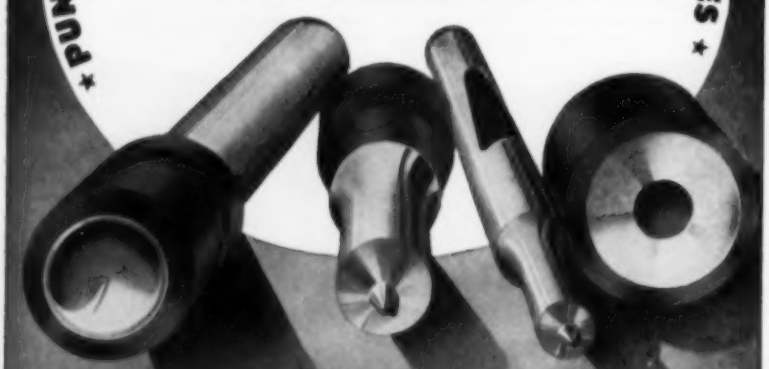


GEO. F. MARCHANT COMPANY
1420-34 So. ROCKWELL STREET • CHICAGO 8, ILLINOIS

NEW PRODUCTS and equipment

circulating air to cooler surfaces. The rated temperature rise is 131° F. *Write*: General Purpose Component Motor Department, General Electric Co., Schenectady 5, N. Y. *Phone*: Franklin 4-2211

Fluid Drives

Class 2, adjustable speed, fluid drives come in four sizes. They are used with 1-to-25-hp motors at operating speeds of 1200 and 1800 rpm.

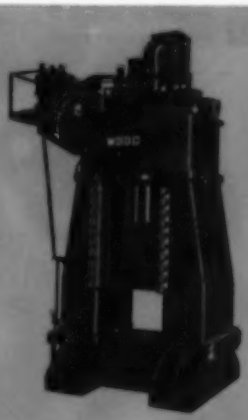
The units protect motors and machinery from shock loads, torsional vibration and excessive torque. The drive motor can come up to speed under virtually no-load conditions.

They can be installed for direct drive by using a separately mounted constant speed electric motor, or they may use a V-belt or chain drive. Output connections may be direct, belt or chain. *Write*: American Blower Corp., Detroit 32, Mich. *Phone*: Trinity 2-4300

Automatic Press

The 75-ton Flexopress gives prolonged die life because of its anti-friction, ball bearing raceway construction. The slide, which has four raceways operating in hardened and ground steel inserts, maintains vertical accuracy within 0.0005-in. and parallelism between slide face and bed within 0.0015-in.

Low ram inertia allows operation of up to 370 strokes a minute.



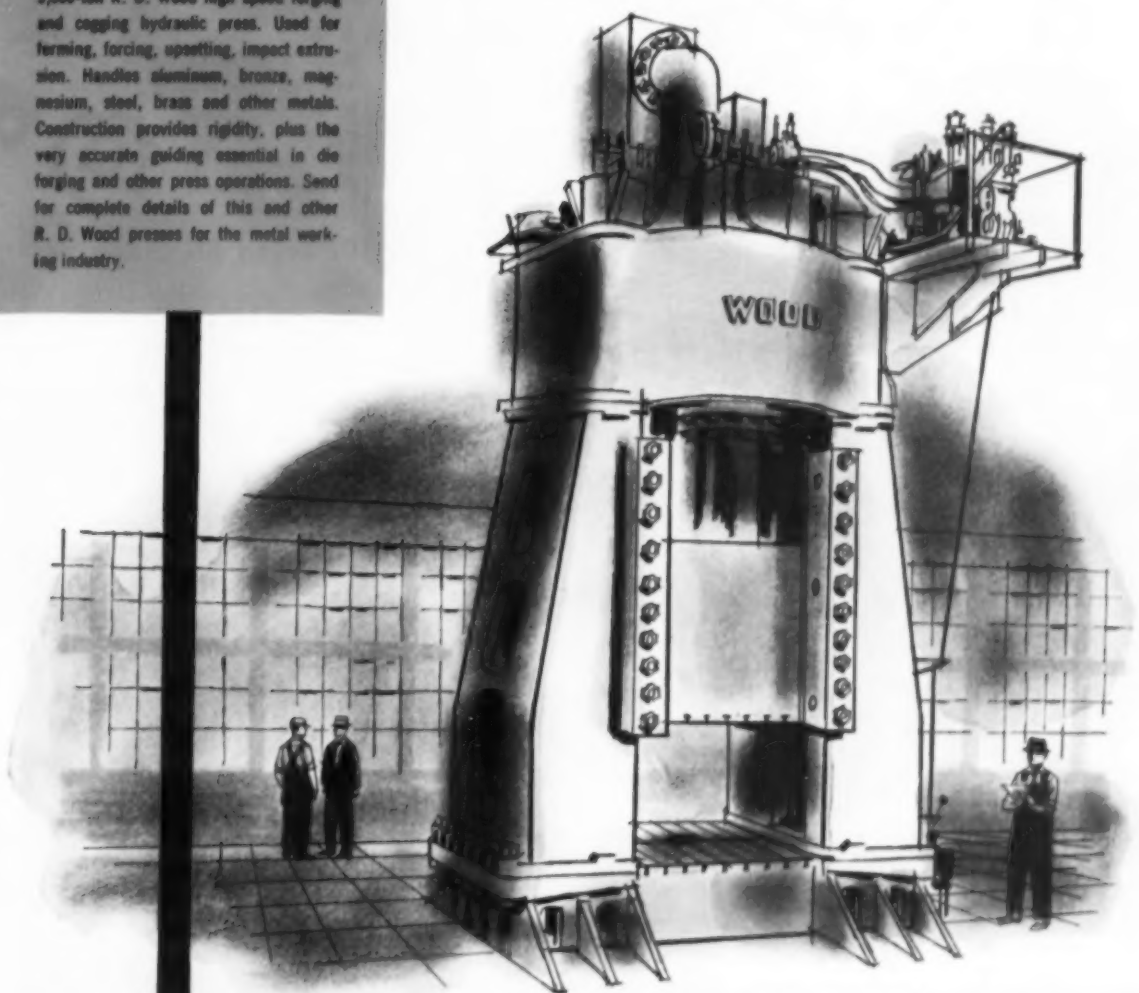
3,000-ton R. D. Wood high speed forging and cogging hydraulic press. Used for forming, forcing, upsetting, impact extrusion. Handles aluminum, bronze, magnesium, steel, brass and other metals. Construction provides rigidity, plus the very accurate guiding essential in die forging and other press operations. Send for complete details of this and other R. D. Wood presses for the metal working industry.

150 years of excellence

This is not an empty claim. It's a fact and a challenge.

In more than 150 years of service to industry, R. D. Wood's name has never appeared on a press of inferior quality.

You can *see* the proof of R. D. Wood quality in the precise design, select materials, and sound craftsmanship that distinguish our presses. And you can *see* the results of this quality in smooth, dependable performance, increased production, economical maintenance.



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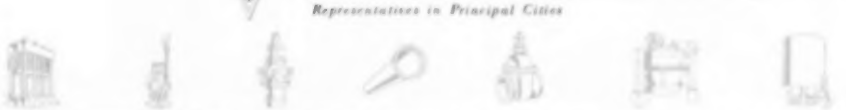
Representatives in Principal Cities



MAKERS OF HYDRAULIC PRESSES AND VALVES • FIRE HYDRANTS • CAST IRON PIPE • GATE VALVES • GAS PRODUCERS • ACCUMULATORS

How About Malleable?

For tough service in heavy duty equipment, prominent manufacturer chooses malleable iron

Products that must be rugged and durable — like the important lawn maintenance machine below — are "naturals" for the application of malleable iron castings. This is an example of using malleable for a number of its advantages — sturdiness, uniformity, machinability, economy and appearance.

It pays you to find out how malleable foundry engineers can help you with ideas for cost-reducing and better design. Write to Malleable Founders' Society for copies of "Malleable Iron Facts" and name of your nearest malleable foundry.

Product and parts photos by courtesy of Toro Mfg. Corp., Minneapolis.

Malleable FOUNDERS' SOCIETY

1800 Union Commerce Building Cleveland 14, Ohio

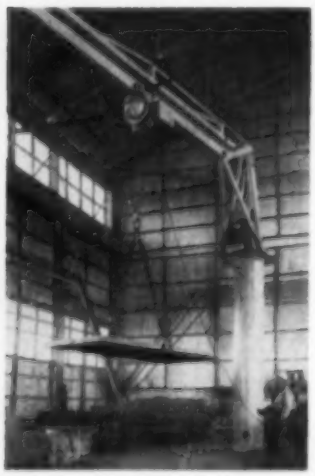
NEW PRODUCTS and equipment

A 15-in. slide opening accommodates work up to 14 in. wide. The automatic feed is adjustable up to 8 in. per stroke. The stroke is 2½-in. *Write*: Precision Welder & Flexopress Corp., Cincinnati, O. *Phone*: Elmhurst 1-3300

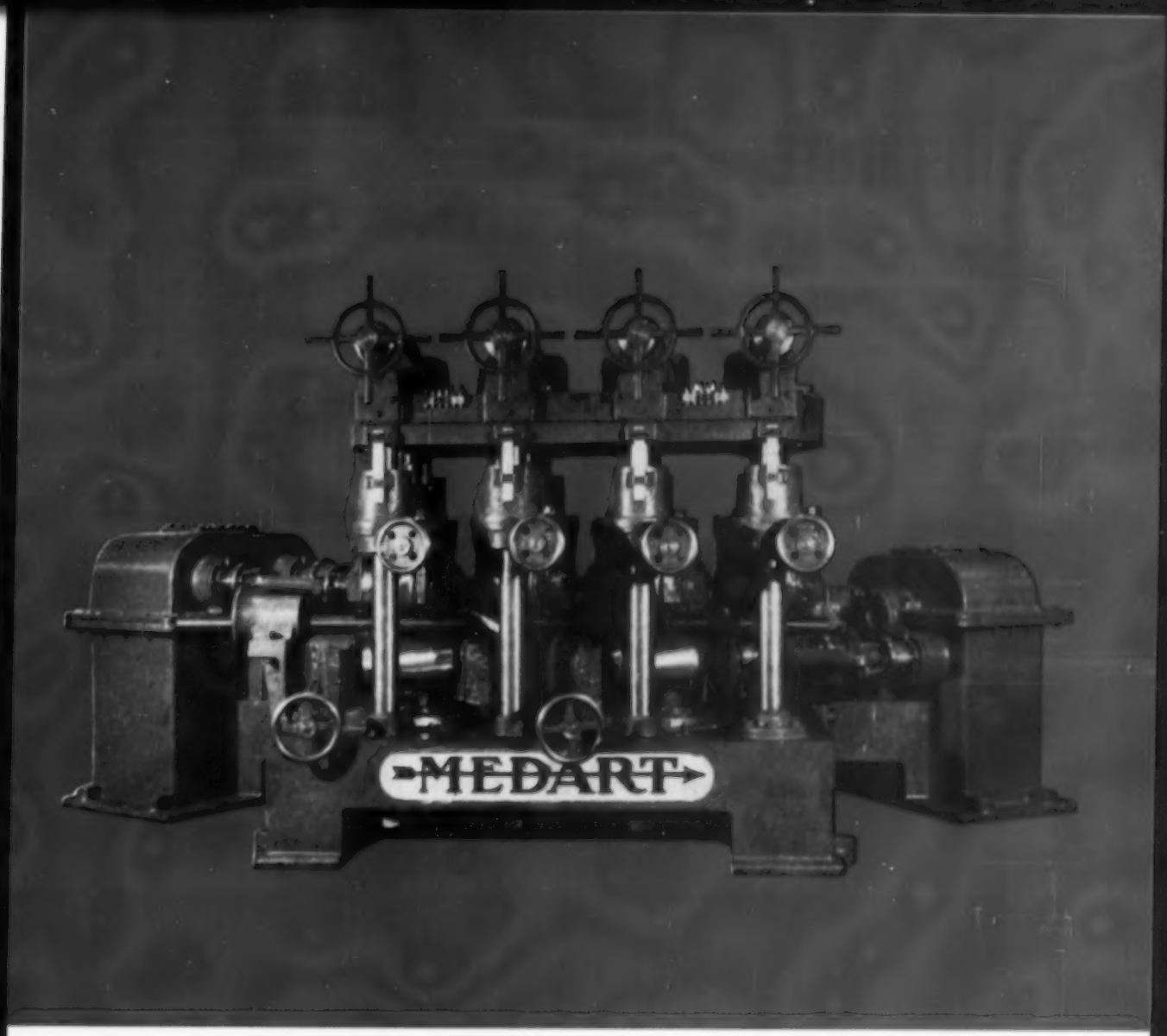
Powered Jib Crane

Lifting capacities of 6, 7½, 10 and 15 tons are provided by this power-rotated unit. Each crane has a 25 ft boom.

Heavy duty electromechanical motor brakes, plus built-in regenerative electric braking action, give absolute control of boom and load.



All controls for the jib crane and the hoist are suspended together from the hoist to permit handling by a single operator. *Write*: R. G. LeTourneau Inc., 2399 S. MacArthur, Longview, Tex. *Phone*: Plaza 3-4411



BLAW-KNOX MEDART makes what it takes

for high speed, Multiroll Tube straightening

Developed to meet the requirements of pipe and tube mills, the Blaw-Knox Medart Multicycle Rotary Straightener delivers high speed precision straightening of pipe and tubular products. It differs from other six roll machines in that the sixth roll is also a straightening or bending roll. In conjunction with the middle bending roll, it imposes a duplex straightening cycle on the workpiece.

Unbalanced torque on the workpiece is eliminated since all four feed rolls are driven from a single motor. This insures positive, synchronized feed and torque balance. What's more, this application of balanced torque permits thin wall tubular straightening not possible with other types of machines. Delivery speed is limited only by the condition and properties of the workpiece which may limit the torque and pressure applied.

The Blaw-Knox Medart Multicycle Rotary Straightener is available in all sizes for handling materials in diameters ranging from ¼" to 18". Larger sizes will be designed upon request.

Contact us at any time for detailed information, technical assistance or service.

50th Anniversary
BLAW-KNOX
1906 1956

BLAW-KNOX COMPANY
Foundry and Mill Machinery Division
Blaw-Knox Building • 300 Sixth Avenue
Pittsburgh 22, Pennsylvania

CONTINENTAL

NEW literature

Write directly to the company for a copy

Flat Lapping

A 4-page bulletin lists the advantages of flat lapping in finishing metals, plastics, ceramics, glass and other materials. Lapping Division, J. B. Maris Co., 14 Henry St., Bloomfield, N. J.

Painting Catalog

Here's information on spray painting products for the maintenance and contract painter. DeVilbiss Co., 300 Phillips Ave., Toledo 1, O.

Floor Trucks

A 64-page catalog presents a complete line of floor trucks, including platform and hand models, trailers, barrel skids, dollies and skid platforms. Hamilton Caster & Mfg. Co., Hamilton, O.

Silver Brazing Alloys

Bulletin 15-55, 16 pages, covers brazing shims for carbide tools, silver brazing alloys and fluxes. Tricon Mfg. Co., 8008 S. Wallace St., Chicago 20, Ill.

Variable Speed Drives

Booklet 20P50, 44 pages, gives design features, drive principles and horsepower rating tables, plus tables for the selection of drives. Allis-Chalmers Mfg. Co., 1021 S. 70th St., Milwaukee, Wis.

Couplings

Bulletin V-169-E, 8 pages, gives specifications and horsepower rating charts of fixed bore, chain, flexible and rigid couplings. Browning Mfg. Co., Maysville, Ky.

Seals and Packings

Molded rubber products, shaft and face seals, belting, packings and industrial leather products are described in a 16-page bulletin. Chicago-Allis Mfg. Co., 113-125 N. Green St., Chicago 7, Ill.

Milling Cutters

A cutter which uses throwaway inserts is described in 6-page bulletin C-85. Wesson Co., 1220 Woodward Heights Blvd., Ferndale 20, Mich.

Bronze Bearings

Bulletin S-56, 22 pages, includes engineering data and dimensions of self-lubricating bearings from ⅛ to 4 in. ID. Amplex Division, Chrysler Corp., Detroit 31, Mich.

Welded Chain

Catalog ADV-701, 62 pages, depicts over 25 types of welded chain and chain assemblies, plus a complete line of accessories. Advertising Division, Republic Steel Corp., 3100 E. 45th St., Cleveland 27, O.

Resin-Coated Sand

A 16-page bulletin outlines the various ways to coat sand with resins. Durez Plastics Division, Hooker Electrochemical Co., Walck Rd., North Tonawanda, N. Y.

Thermocouple Data Book

Bulletin F-5228-3, 40 pages, discusses construction and use of thermocouples and radiation detectors for industrial control applications. Wheelco Instruments Division, Barber-Colman Co., Rockford, Ill.

Forming Machines

A 44-page catalog covers a complete line of benders, brakes, press brakes, notchers, punch presses, rod parters, rollers, shears and spring winders. O'Neil-Irwin Mfg. Co., 619 Eighth Ave., Lake City, Minn.

Enclosed Conductor Systems

Mobile safety electrification for cranes, monorails and all moving ma-

Here is an IMPORTANT conveyor message for the metalworking industry

Write today for complete information.

MAY-FRAN ENGINEERING, INC.
1725 Clarkstone Road Cleveland 12, Ohio

NEW LITERATURE

chinery is described in a 32-page bulletin. Insul-8 Corp., 1369 Industrial Rd., San Carlos, Calif.

Electric Brakes and Clutches

Complete specifications for electric brakes, clutches and clutch-brakes are given in bulletin WEB 6212, 8 pages. Warner Electric Brake & Clutch Co., Beloit, Wis.

Constant Potential Control

A complete line of control equipment for auxiliaries in metal rolling and processing industries is covered in bulletin GEA-6318, 4 pages. General Electric Co., Schenectady 5, N. Y.

Powder Cutting

Bulletin 1051, 4 pages, presents recent uses of iron powder processes in cutting, scarfing, gouging, lancing and washing. Hoeganaes Sponge Iron Corp., Riverton, N. J.

Data Transmission System

Bulletin 700, 14 pages, presents a system for accurate and rapid transmission of metering data. Simplex Valve & Meter Co., 7 E. Orange St., Lancaster, Pa.

Turret Lathes

An 18-page bulletin 1174-B describes three models of a ram type, universal turret lathe. Gisholt Machine Co., Madison 10, Wis.

Plastic Pipe

A normal and a high impact grade of rigid polyvinyl chloride pipes and fittings are described in a bulletin. Alloy Tube Division, Carpenter Steel Co., Union, N. J.

Industrial Spectrograph

An 8-page bulletin covers the performance and uses of three models of a precision industrial spectrograph. Jarrell-Ash Co., 26 Farwell St., Newtonville, Mass.

Surface Roughness

Equipment for shop measurement of surface roughness is presented in a 14-page bulletin. Micrometrical Mfg. Co., 345 S. Main St., Ann Arbor, Mich.

Diecasting Standards

Metallurgical data on aluminum, brass and magnesium diecastings are given in eight new Metallurgical Series Product Standards. American Die Casting Institute Inc., 366 Madison Ave., New York 17, N. Y.

Continuous Processing Lines

Bulletin 561, 6 pages, illustrates equipment for punch, shear and continuous strip lines. Herr Equipment Corp., Warren, O.

Atomic Equipment

Properties of graphite and its uses in atomic equipment are given in a 6-page bulletin S-4905. Department E, National Carbon Co., 30 E. 42nd St., New York 17, N. Y.

Aircraft Bolts

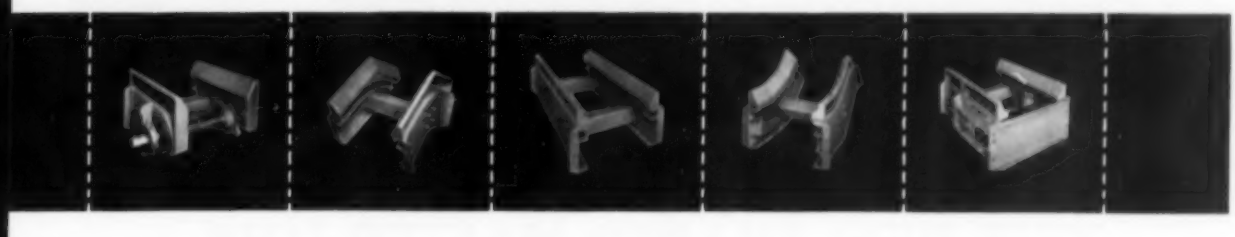
The manufacture of aircraft quality bolts is described in a 12-page booklet. Aero Supply Mfg. Co. Inc., Corry, Pa.

Protective Equipment

Industrial gloves, aprons and sleeves are described in bulletin 56B, 28 pages. Charleston Rubber Co., Stark Industrial Park, Charleston, S. C.

Fasteners

Sizes and specifications of socket head capscrews, setscrews, stripper bolts, pressure plugs, dowel pins, screw keys, etc., are given in a 30-page catalog. Standard Pressed Steel Co., Jenkintown, Pa.



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Through standardization, MAY-FRAN now makes it possible to assemble individual components into virtually any type of conveyor to handle a wide range of products or materials. Straight sections . . . concave or convex sections . . . take-up charge sections and discharge-end sections can be furnished to meet specific requirements of belt width as well as load bearing and volume capacities.

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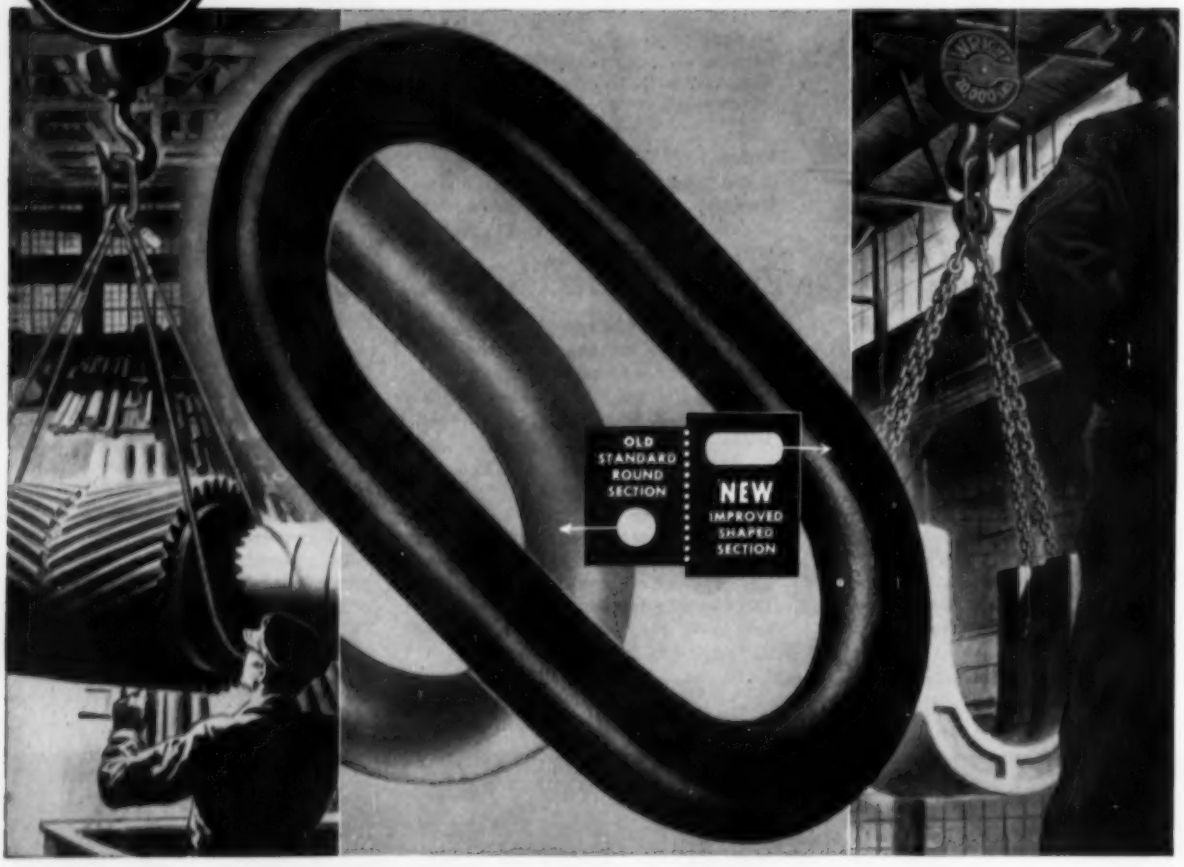

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Better Value

STEEL Market Outlook

June 11, 1956

ALTHOUGH steel demand has lost some of its zip, the letup is not reflected in any slackening in steelmaking operations.

The national ingot rate has held unchanged at 96.5 per cent for four successive weeks. This is equal to an output of about 2,375,000 net tons weekly, or better than average weekly production in any month last year except two. Those weeks were during November and December.

STRIKE HURTS—Were it not for a work stoppage at the Birmingham plants of the Tennessee Coal & Iron Division, U. S. Steel Corp., ingot production would have been maintained at a pace only slightly under the all-time high attained last March. The strike is in its fifth week.

Expectations are the current level of operations will hold through the remainder of this month. What happens then will depend on how steel wage negotiations go.

SUMMER LULL—Even should a steel strike be averted (still anyone's guess), production will probably sag in the third quarter. Seasonal factors will cut output. More importantly, demand will be less pressing in July and August, and the mills are likely to take advantage of the letup in pressure to make much needed equipment repairs.

In any case, operations are not likely to fall much below 85 per cent of capacity. In fact, with demand for heavy products continuing unabated, some steel men are confident of maintaining close-to-capacity production through the summer.

UNCERTAINTY— Some consumers have been seeking to build inventories as a hedge against higher prices at midyear, and a severe summer shortage in event the steelworkers take a walk at the end of June.

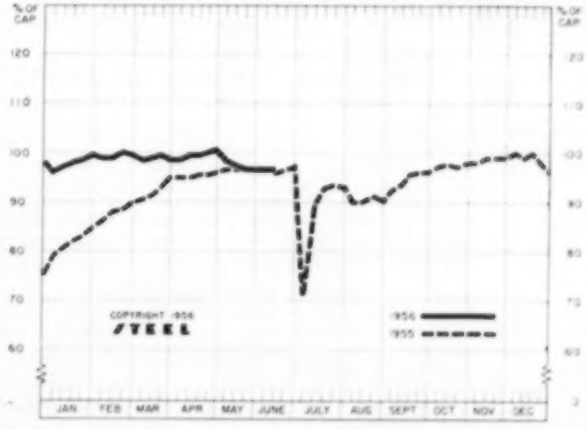
On the other hand, some evidence points to increasing retrenchment in demand. Significantly, not only have some large users cut back on their summer requirements, but signs of similar moves by some miscellaneous buyers are visible.

INVENTORIES—Certain consumers undoubtedly have accumulated sizable stocks. A large auto company, for example, is reported offering cold-rolled sheets to its suppliers in sufficient volume to assure uninterrupted production of the first 200,000 of its 1957 model cars and trucks. The offer, contingent on vendors' inability to obtain steel on their own account by the end of June, indicates auto inventories are substantial.

In other consuming areas, extra-allotment tonnage is not being snapped up in all cases. This would seem to indicate much improved supply conditions.

PRICES—Weakness pervades the scrap market. STEEL's composite on steelmaking grades of scrap declined for the sixth successive week to $46.17. This compares with the high of $55.33 recorded in the week ended Apr. 25. Other markets are steady, with the finished steel composite firm at $128.98, malleable pig iron, $61.27, No. 2 foundry iron, $60.27, and basic iron, $59.80. No significant revision in prices is expected pending clarification of the current wage issue.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

(Percentage of Capacity Engaged)

	Week Ended June 10	Change	Same Week 1955	Same Week 1954
Pittsburgh	99	+ 1*	98	70
Chicago	99	— 1.5*	97.5	85
Mid-Atlantic	98	0	95.5	57
Youngstown	101	0	98	69
Wheeling	100.5	0	94.5	88.5
Cleveland	99.5	+ 4*	102.5	70.5
Buffalo	105	0	104.5	67.5
Birmingham	23.5	0	93.5	78.5
New England	89	0	90	52
Cincinnati	94.5	— 1.5	91	69.5
St. Louis	95	— 1.5	95.5	72.5
Detroit	95	— 1	93	76.5
Western	106	— 1	107	85
National Rate	96.5	0	96	73

INGOT PRODUCTION‡

	Week Ended June 10	Week Ago	Month Ago	Year Ago
INDEX (1947-1949=100)	147.7†	147.5	145.9	142.3
NET TONS (In thousands)	2,373†	2,379	2,343	2,286

*Change from preceding week's revised rate. †Estimated. ‡Amer. Iron & Steel Institute. Weekly capacity (net tons): 2,461,893 in 1956; 2,413,278 in 1955; 2,384,549 in 1954.

Metalworking Outlook—p. 61 *Technical Outlook—p. 111*

Price Indexes and Composites

FINISHED STEEL PRICE INDEX (Bureau of Labor Statistics)

	June 5 1956	May 29 1956	Month Ago	May Average
(1947-1949=100)	158.2	158.2	158.0	158.1

AVERAGE PRICES OF STEEL (Bureau of Labor Statistics)

Week Ended June 5

Prices include mill base prices and typical extras and deductions. Units are 100 lb except where otherwise noted in parentheses. For complete description of the following products and extras and deductions applicable to them, write to STEEL.

Rails, Standard, No. 1	$4.800	Sheets, Electrical	$10.175
Rails, Light, 40 lb	6.217	Strip, C.R., Carbon	5.243
Tie Plates	5.625	Strip, C.R., Stainless, 403 (lb)	0.444
Axles, Railway	8.350	Strip, H.R., Carbon	5.606
Wheels, Freight Car, 33 in. (per wheel)	52.50	Pipe, Black, Buttweld (100 ft)	16.997
Plates, Carbon	5.200	Pipe, Galv., Buttweld (100 ft)	21.137
Structural Shapes	4.867	Pipe, Line (100 ft)	170.038
Bars, Tool Steel, Carbon (lb)	0.469	Casing, Oil Well, Carbon (100 ft)	165.120
Bars, Tool Steel Alloy, Oil Hardening Die (lb)	0.560	Casing, Oil Well, Alloy (100 ft)	256.030
Bars, Tool Steel, H. R., Alloy, High Speed W 6.75, Cr 4.5, V 2.1, Mo 5.5, C 0.80 (lb)	1.185	Tubes, Boiler (100 ft)	41.530
Bars, Tool Steel, H.R., Alloy, High Speed W-18, Cr 4, V 1 (lb)	1.480	Tubing, Mechanical, Carbon (100 ft)	21.360
Bars, H.R., Alloy	9.475	Tubing, Mechanical Stainless, 304 (100 ft)	178.897
Bars, H.R., Stainless, 303 (lb)	0.456	Tin plate, Hot-dipped, 1.25 lb	9.333
Bars, H.R., Carbon	5.500	Tin Plate, Electrolytic, 0.25 lb	8.033
Bars, Reinforcing	5.313	Black Plate, Canmaking Quality	7.133
Bars, C.F., Carbon	9.000	Wire, Drawn, Carbon	8.575
Bars, C.F., Alloy	12.375	Wire, Drawn, Stainless 430 (lb)	0.590
Bars, C.F., Stainless, 302 (lb)	0.475	Bale ties (bundle)	6.537
Sheets, H.R., Carbon	5.345	Nails, Wire, 8d Common	8.595
Sheets, C.R., Carbon	6.214	Wire, Barbed (80-rod spool)	7.847
Sheets, Galvanized	7.770	Woven Wire Fence (20-rod roll)	18.638
Sheets, C.R., Stainless 302 (lb)	0.590		

STEEL's FINISHED STEEL PRICE INDEX*

	June 6 1956	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Index (1935-39 av.=100)	210.45	210.45	210.45	194.53	171.92
Index in cents per lb	5.701	5.701	5.701	5.270	4.657

STEEL's ARITHMETICAL PRICE COMPOSITES

Finished Steel, NT*	$128.98	$128.98	$128.98	$118.45	$106.33
No. 2 Fdry Pig Iron, GT	60.27	60.27	60.27	56.54	52.54
Basic Pig Iron, GT	59.80	59.80	59.80	56.04	52.16
Malleable Pig Iron, GT	61.27	61.27	61.27	57.27	53.27
Steelmaking Scrap, GT	46.17	47.17	53.60	35.60	44.60

*For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54; of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED STEEL	June 6 1956	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bars, H.R., Pittsburgh	4.65	4.65	4.65	4.30	3.70
Bars, H.R., Chicago	4.65	4.65	4.65	4.30	3.70
Bars, H.R., deld. Philadelphia	4.93	4.93	4.93	4.55	4.20
Bars, C.F., Pittsburgh	6.25*	6.25*	6.25*	5.40	4.55
Shapes, Std., Pittsburgh	4.60	4.60	4.60	4.25	3.65
Shapes, Std., Chicago	4.60	4.60	4.60	4.25	3.65
Shapes, deld., Philadelphia	5.00	5.00	5.00	4.53	3.91
Plates, Pittsburgh	4.50	4.50	4.50	4.225	3.70
Plates, Chicago	4.50	4.50	4.50	4.225	3.70
Plates, Coatesville, Pa.	4.80	4.80	4.80	4.225	4.15
Plates, Sparrows Point, Md.	4.50	4.50	4.50	4.225	3.70
Plates, Claymont, Del.	5.35	5.35	5.35	4.225	4.15
Sheets, H.R., Pittsburgh	4.325	4.325	4.325	4.05	3.60-3.75
Sheets, H.R., Chicago	4.325	4.325	4.325	4.05	3.60
Sheets, C.R., Pittsburgh	5.325	5.325	5.325	4.95	4.35
Sheets, C.R., Chicago	5.325	5.325	5.325	4.95	4.35
Sheets, C.R., Detroit	5.325-5.425	5.325-5.425	5.325-5.425	5.10	4.55
Sheets, Galv., Pittsburgh	5.85	5.85	5.85	5.45	4.80
Strip, H.R., Pittsburgh	4.325	4.325	4.325	4.05	3.75-4.00
Strip, H.R., Chicago	4.325	4.325	4.325	4.05	3.50
Strip, C.R., Pittsburgh	6.25	6.25	6.25	5.75	4.65-5.35
Strip, C.R., Chicago	6.25-6.35	6.25-6.35	6.25-6.35	5.85	4.90
Strip, C.R., Detroit	6.35	6.35	6.35	5.90	4.35-5.60
Wire, Basic, Pittsburgh	6.60	6.60	6.60	5.75	4.85-5.10
Nails, Wire, Pittsburgh	7.60	7.60	7.60	6.85	5.90-6.20
Tin plate (1.50 lb), box, Pitts.	$9.85	$9.85	$9.85	$9.05	$8.70

*Including 0.25c for special quality

SEMIFINISHED STEEL					
Billets, forging, Pitts. (NT)	$84.50	$84.50	$84.50	$78.00	$66.00
Wire rods, ½-⅝" Pitts.	5.375	5.375	5.375	4.675	4.10-4.30

PIG IRON, Gross Ton					
Bessemer, Pitts.	$61.00	$61.00	$61.00	$57.00	$53.00
Basic Valley	60.00	60.00	60.00	56.00	52.00
Basic, deld. Phila.	63.76	63.76	63.76	59.66	56.49
No. 2 Fdry, Pitts.	60.50	60.50	60.50	56.50	52.50
No. 2 Fdry, Chicago	60.50	60.50	60.50	56.50	52.50
No. 2 Fdry, deld. Phila.	64.26	64.26	64.26	55.16	56.99
No 2 Fdry, Birm.	55.00	55.00	55.00	52.88	48.88
No. 2 Fdry (Birm.) deld. Cin.	62.70	62.70	62.70	60.58	55.33
Malleable, Valley	60.50	60.50	60.50	56.50	52.50
Malleable, Chicago	60.50	60.50	60.50	56.50	52.50
Ferromanganese, Duquesne	215.00†	215.00†	215.00†	190.00†	188.00*

†74-76% Mn, net ton. *75-82% Mn, gross ton, Etna, Pa.

SCRAP, Gross Ton (Including broker's commission)					
No. 1 Heavy Melt, Pittsburgh	$44.50	$45.50	$51.50	$34.50	$45.00
No. 1 Heavy Melt, E. Pa.	48.00	48.00	56.00	36.50	43.50
No. 1 Heavy Melt, Chicago	46.00	46.00	51.50	34.00	43.50
No. 1 Heavy Melt, Valley	49.50	49.50	57.50	34.50	45.00
No. 1 Heavy Melt, Cleve.	47.50	47.50	54.50	31.50	44.00
No. 1 Heavy Melt, Buffalo	45.50	45.50	53.50	29.50	44.00
Rails, Rerolling, Chicago	69.50	71.50	72.50	51.50	52.50
No. 1 cast, Chicago	45.50	45.50	52.50	40.50	49.00

COKE, Net Ton					
Beehive, Furn, Connlsvl.	$14.125	$14.125	$14.125	$13.75	$14.75
Beehive, Fdry, Connlsvl.	16.50	16.50	16.50	16.75	17.50
Oven, Fdry, Chicago	27.00	27.00	27.00	24.50	21.00

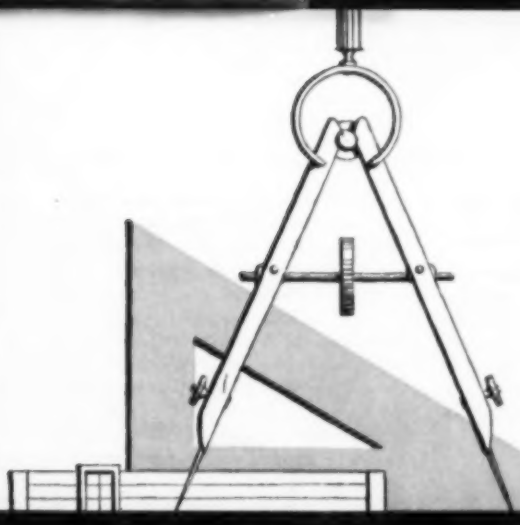
Daily Nonferrous Price Record

	June 6 Price	Last Change	Previous Price	May Avg.	Apr. Avg.	June 1955 Avg.
Copper	40.00-46.00	May 29, 1956	43.00-46.00	45.096	47.500	36.000
Lead	15.80	Jan. 13, 1956	16.30	15.800	15.800	14.800
Zinc	13.50	Jan. 6, 1956	13.00	13.500	13.500	12.250
Tin	94.25	June 6, 1956	94.50	97.024	99.270	93.668
Nickel	64.50	Nov. 24, 1954	60.00	64.500	64.500	64.500
Aluminum	25.90	Mar. 29, 1956	24.40-25.90	25.900	25.900	23.200
Magnesium	33.75	Apr. 16, 1956	32.500	33.750	33.150	28.500

Quotations in cents per pound based on: COPPER, deld. Conn. Valley; LEAD, common grade, deld. St. Louis; ZINC, prime western, E. St. Louis; TIN, Straits, deld. New York; NICKEL, electrolytic cathodes, 99.9%, base size at refinery, unpacked; ALUMINUM, primary ingots, 99 + %, deld.; MAGNESIUM, pig, 99.8%, Velasco, Tex.

What You Can Use the Markets Section for:

- **A source of price information.** Current prices are reported each week. Price changes are shown in italics. Price trends are shown in tables of indexes and comparisons.
- **A directory of producing points.** Want to know who makes something, or where it is made? The steel price tables alphabetically list the cities of production and indicate the producing company. If you are a buyer, you may want to make a map showing comparative distances of sources of supply and to help you compute freight costs. If you are a seller of supplies you can make a map to spot your sales possibilities.
- **A source of price data for making your own comparisons.** Maybe you want to keep a continuous record of price spread between various forms of steel. You can get your base price information from STEEL's price tables.
- **A source of information on market trends.** Newsy items tell you about the supply-demand situation of materials, including iron and steel, nonferrous metals and scrap. Other articles analyze special situations of interest and importance to you.
- **Reports on iron and steel production, and materials and product shipments.**



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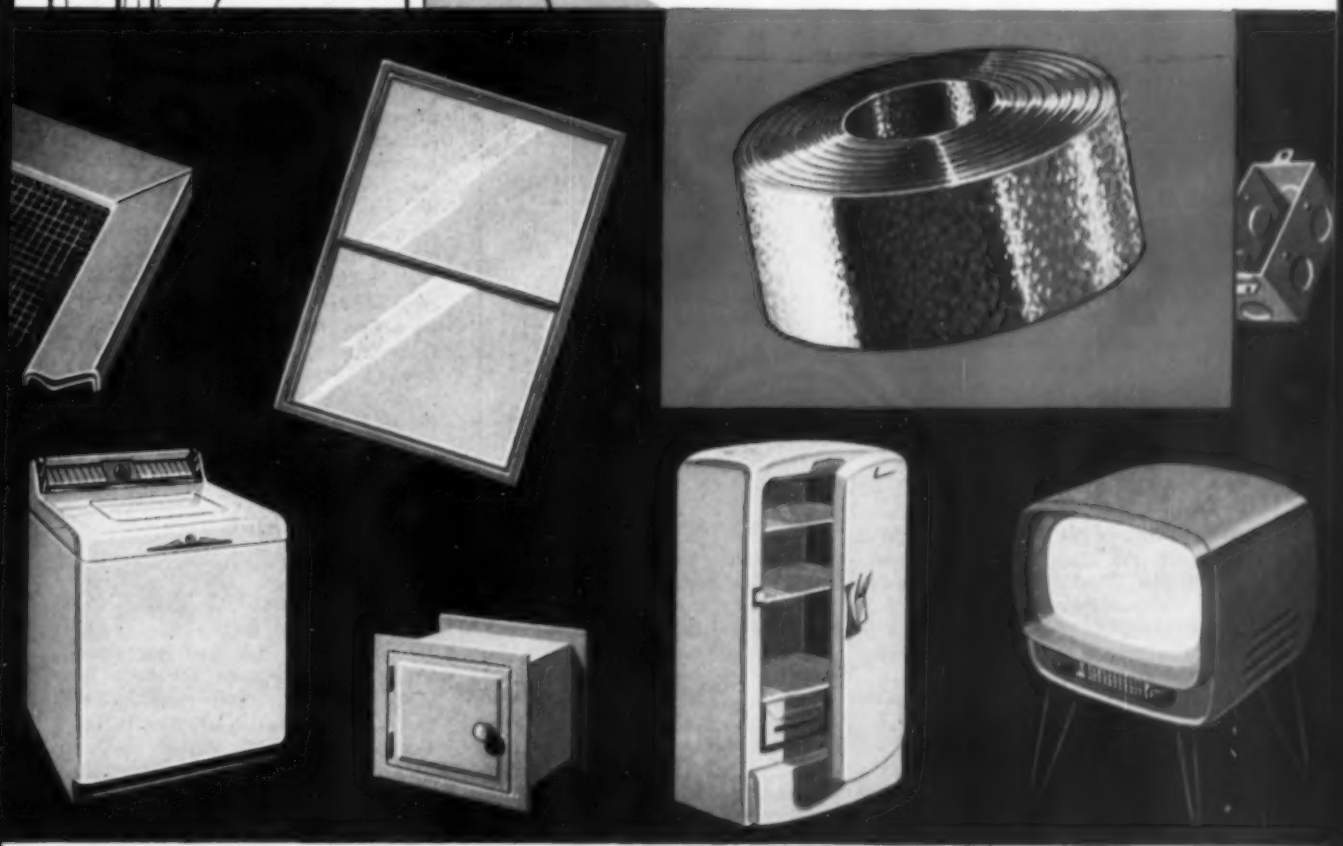

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Nonferrous Metals

Companies interested in entering the nickel field are asking: "Can we compete with established producers?" Meanwhile, Congress is crying for surveys and stand-by controls

Nonferrous Metal Prices, Pages 166 & 167

SOME Congressmen are pressing for stand-by controls on nickel, and most are urging that a "searching investigation of the nickel industry be initiated."

An investigation will show there are injustices in the distribution program, claim lawmakers. While this is probably true, many observers believe that International Nickel Co. has done a more efficient job of distributing scarce nickel than any government agency could possibly have done. They say: "Capitol Hill should forget the past and turn its attention to how the U. S. is going to get more nickel."

Background—While the Office of Defense Mobilization (through the General Services Administration) is preparing to issue fast tax write-offs for companies interested in entering the nickel field, the big question is: How many companies will be interested in producing the metal at the current market price (64.50 cents per pound).

Anyone expecting to become a nickel producer will have to ask the following questions: 1. Will I be able to compete against Inco and National Lead Co. (presently running the U. S. Nicaro project) in the future? 2. What happens if the military reduces its take and stockpile objectives are finally reached? 3. Can I build expensive reduction facilities, amortize plant and equipment in five years and still make a profit? Freeport Sulphur Co. is reportedly planning to spend some $85 million if it definitely decides to become a primary nickel producer.

The behind-the-scenes thinking of most of the interested companies may be: "We will go along with the government for a while and see if premiums can be worked out for any nickel we may produce in the next several years."

Meanwhile—National Lead's facilities for making nickel are about ready to go. It is anticipated that production will get under way about July 1 and that by September the former stainless steelmaking facility (Philadelphia) will be producing metallic nickel at capacity (14 million lb annually).

In Washington, ODM has gone one step farther in an attempt to find out where the nickel is going by putting distribution controls on nickel alloy deliveries, effective in the fourth quarter (see page 61).

Lead, Zinc Sales Improve

Lead and zinc producers are registering somewhat better sales as first-of-the-month orders flow in. Most steel producers are still taking substantial tonnages of zinc, but brass mill sales are at least 30 per cent off from the same period a year ago. One thing is apparent: Users are working off inventories and then ordering lead and zinc "for the next day if possible." One bright spot: If inventories are kept at low levels and the fourth quarter business upsurge materializes, it will mean a peak fourth quarter.

STEEL'S Metal Price Averages for May, 1956
(Cents per lb)

Electrolytic Copper, deld. Connecticut	45.096
Lead, St. Louis	15.800
Prime Western Zinc, E. St. Louis, Ill.	13.500
Straits Tin, New York	97.024
Primary Aluminum Ingots, deld.	25.900
Magnesium, Velasco, Tex.	33.750
Nickel, f.o.b. refinery	64.500

Copper: Prices Stabilizing?

The London Metal Exchange copper quotation began to show signs of recovery last week as the price rose to 39.50 cents per pound on Wednesday, June 6. U. S. primary producers continue to hold their price at the 46-cent-a-pound level. Custom smelters' price: 40 cents a pound.

European demand appears to be dipping only slightly as inventory readjustments and some production cutbacks in England affect the market. West German demand remains high as auto production continues at peak levels.

Food for thought: Look for primary producers to hang onto the 46-cent-a-pound price for copper until the market stabilizes. Then watch for a drastic slash (perhaps to 36 cents a pound) in the primary producers' selling price. Reason: 1. A reduction of 2 or 3 cents may not bring any more orders. 2. Primary producers are interested in getting back to a sound pricing structure. This could be several weeks off as primary copper companies have sold June production.

Aluminum Supply Grows

There is no aluminum shortage. Cutbacks in Detroit are continuing to make more supplies available, but primary producers claim their inventories are normal. Producers point out the tonnages being turned down by the Motor City are being sold to producers of aluminum shapes, tubing and wire products.

Aluminum salesmen in Canada have dented the railway industry. Canadian National Railways recently placed orders for 3000 additional boxcars. The order specified that the roofs will be made of aluminum. Since late 1955, a total of 6750 aluminum roofs for Canadian boxcars have been ordered.

Tin Sales Light

Tin sales are soft. In sympathy with the falling prices of other metals, tin prices fell to around the 93.75-cent-per-pound level last week. Most tin men feel that the price would have remained at about 96 cents a pound if other metal prices had not fallen so drastically in the last two weeks. Tin dealers are beginning to get some cutbacks from steel companies as labor negotiations near the critical period.

The buffer organization sponsored by the International Tin Agreement plans to get into operation by July 1. The buffer manager has been authorized to buy quantities of tin in England at prices up to about 90 cents a pound. The U. S. price, adding shipping and other charges, would bring the price to almost 93 cents a pound. While this upper limit has been set for the buffer manager, it is possible he may enter the market if tin prices stay at present or slightly lower levels. Tin producers will be hesitant to lower prices below the limit until they find out if the buffer manager will buy tin for the organization's stockpile at 90 cents a pound.

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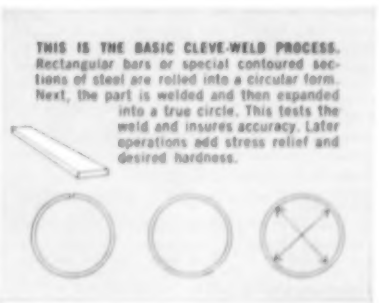
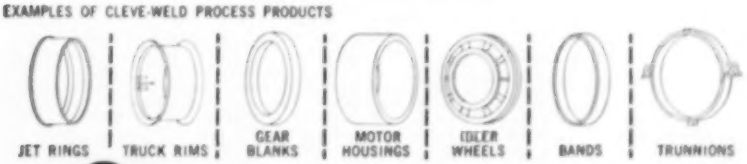
2. Reduce finished machining time to a minimum.
3. Speed your overall production.

From simple gear blanks to special alloy jet rings, the Cleve-Weld Process gives the same results—better performance and reduced costs. *Often the savings in machine time and material waste alone pay for the finished Cleve-Weld part.*

Find out the full story on how Cleve-Weld's 45 years of design, metallurgical and production experience can save you money, improve your product. Write or send drawings to Circular Welded Products Sales Department at address below.


THIS IS THE BASIC CLEVE-WELD PROCESS. Rectangular bars or special contoured sections of steel are rolled into a circular form. Next, the part is welded and then expanded into a true circle. This tests the weld and insures accuracy. Later operations add stress relief and desired hardness.

EXAMPLES OF CLEVE-WELD PROCESS PRODUCTS



Another AMF Product
CLEVE-WELD PROCESS
RIMS · RINGS · WELDMENTS

CLEVELAND WELDING DIVISION
AMERICAN MACHINE & FOUNDRY COMPANY
Cleveland 7, Ohio

SEND THIS COUPON NOW

Cleveland Welding Division
American Machine & Foundry Company
West 117th Street and Berea Road
Cleveland 7, Ohio

Please send me your brochure on the cost-cutting Cleve-Weld Process.

Name_____

Title_____

Attach to your company letterhead and mail

Nonferrous Metals

Cents per pound, carlots, except as otherwise noted

PRIMARY METALS AND ALLOYS

Aluminum: 99 + %, ingots, 25.90; pigs, 24.00, 10,000 lb or more, f.o.b. shipping point. Freight allowed on 500 lb or more.

Aluminum Alloy: No. 13, 12% Si, 27.70; No. 43, 5% Si, 27.50; No. 142, 4% Cu, 1.5% Mg, 2% Ni, 29.70; No. 195, 4.5% Cu, 0.8% Si, 29.30; No. 214, 3.8% Mg, 29.30; No. 356, 7% Si, 0.3% Mg, 27.70.

Antimony: R.M.M. brand, 99.5%, 33.00; Lone Star brand, 33.50, f.o.b. Laredo, Tex., in bulk. Foreign brands, 99.5%, 27.00-28.00, New York, duty paid, 10,000 lb or more.

Beryllium: 97%, lump or beads, $71.50 per lb, f.o.b. Cleveland or Reading, Pa.

Beryllium Aluminum: 5% Be, $74.75 per lb of contained Be, f.o.b. Reading, Pa., Elmore, O.

Beryllium Copper: 3.75-4.25% Be, $43 per lb of contained Be, with balance as Cu at market price on shipment date, f.o.b. Reading, Pa., or Elmore, O.

Bismuth: $2.25 per lb ton lots.

Cadmium: Sticks and bars, $1.70 per lb deld.

Cobalt: 97-99%, $2.60 per lb for 550-lb keg; $2.62 per lb for 100-lb case; $2.67 per lb under 100 lb.

Columbium: Powder, $119.20 per lb, nom.

Copper: Electrolytic, 46.00 deld. Conn. valley; 46.00 deld. Midwest; custom smelters, 40.00 deld.; lake, 46.00 deld.; fire refined, 45.75 deld.

Germanium: First reduction, $201.85-$220 per lb; intrinsic grade, $220-$242.67 per lb, depending on quantity.

Gold: U. S. Treasury, $35 per oz.

Indium: 99.9%, $2.25 per troy oz.

Iridium: $100-$110 nom. per troy oz.

Lead: Common, 15.80; chemical, 15.90; corroding, 15.90, St. Louis. New York basis, add 0.20.

Lithium: 99 +, cups or ingots, $11.50; rod $13.50; shot or wire, $14.50, f.o.b. Minneapolis. 100 lb lots.

Magnesium: Pig, 33.75 f.o.b. Velasco, Tex.; ingot, 34.50 f.o.b. Velasco, Tex.

Magnesium Alloys: AZ91B (diecasting), 35.00 deld.; AZ63A, AZ92A, AZ91C (sand casting), 39.25 f.o.b. Velasco, Tex.

Mercury: Open market, spot, New York, $263-$265 per 76-lb flask.

Molybdenum: Powder, 99% hydrogen reduced, $3.20 per lb; pressed ingot, $4.06 per lb; sintered ingot, $5.53 per lb.

Nickel: Electrolytic cathodes, sheets (4 x 4 in. and larger), unpacked, 64.50; 10-lb pigs, unpacked, 67.65; "XX" nickel shot, 69.00; "F" nickel shot or ingots for addition to cast iron, 64.50; prices f.o.b. Port Colborne, Ont., including import duty. New York basis, add 0.92.

Osmium: $80-$100 per troy oz, nom.

Palladium: $23-$24 per troy oz.

Platinum: $103-$110 per troy oz from refineries.

Radium: $16-$21.50 per mg radium content, depending on quantity.

Rhodium: $118-$125 per troy oz.

Ruthenium: $45-$55 per troy oz.

Selenium: 99.5%, $13.50-$15.50 per lb.

Silver: Open market, 90.75 per troy oz.

Sodium: 16.50, c.l.; 17.00, l.c.l.

Tantalum: Sheet, rod, $68.70 per lb; powder, $56.63 per lb.

Tellurium: $1.50-$1.75 per lb.

Thallium: $12.50 per lb.

Tin: Straits, N. Y., spot 94.25; prompt, 94.125.

Titanium: Sponge, 99.3+%, grade A-1 ductile (0.3% Fe max), $3.25; grade A-2 (0.5% Fe max), $2.95 per pound.

Tungsten: Powder, 98.8%, carbon reduced, 1000-lb lots, $4.50 per lb, nom, f.o.b. shipping point; less than 1000 lb add 15.00; 99+% hydrogen reduced, $5.00. Treated ingot, $6.70.

Zinc: Prime Western, 13.50; brass special, 13.75; intermediate, 14.00, East St. Louis, freight allowed over 0.50 per pound. High grade, 14.85; special high grade, 15.25 deld. Diecasting alloy ingot No. 3, 18.00; No. 2, 19.00; No. 5, 18.50, deld.

Zirconium: Ingots, commercial grade, $14.40 per lb; low-halfnium reactor grade, $23.07. Sponge, commercial grade, $7.50-$10.00 per lb, depending on quantity; reactor grade, $14.00-$22.00 per lb, depending on quantity. Powder, electronics grade, $15 per lb; flash grade, $11.50.

(Note: Chromium, manganese and silicon metals are listed in ferroalloy section.)

SECONDARY METALS AND ALLOYS

Aluminum Ingot: Piston alloys, 25.00-27.75; No. 12 foundry alloy (No. 2 grade), 23.75-24.25; 5% silicon alloy, 0.60 Cu max, 25.25-25.50; 13 alloy, 0.60 Cu max, 25.25-25.50; 195 alloy, 25.75-26.00; 108 alloy, 24.00-24.25. Steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 25.00-26.00; grade 2, 23.25-25.25; grade 3, 22.50-24.50; grade 4, 22.00-23.50.

Brass Ingot: Red brass, No. 115, 37.00; tin bronze, No. 225, 49.50; No. 245, 43.00; high-leaded tin bronze, No. 305, 40.25; No. 1 yellow, No. 405, 30.75; manganese bronze, No. 421, 32.75.

Magnesium Alloy Ingot: AZ63A, 36.00; AZ91B, 36.00; AZ91C, 36.00; AZ92A, 36.00.

NONFERROUS PRODUCTS

BERYLLIUM COPPER

(Base prices per lb, plus mill extras, 2000 to 5000 lb, f.o.b. Temple, Pa.; nominal 1.9% Be alloy) Strip, $1.92; rod, bar, wire, $1.89.

COPPER WIRE

Bare, soft, f.o.b. eastern mills, 30,000-lb lots, 51.35¢; l.c.l., 51.95. Weatherproof, 30,000-lb lots, 48.28; l.c.l., 49.03. Magnet wire deld., 15,000 lb or more, $58.68; l.c.l., 59.43.

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh) Sheets, full rolls, 140 sq ft or more, $21.50 per cwt; pipe, full coils, $21.50 per cwt; traps and bends, list prices plus 30%.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill) Sheets, $12.60-$13.10; sheared mill plate, $10.00-$12.00; strip, $12.10-$12.60; wire, $9.00-$11.50; forging billets, $7.25-$7.50; hot-rolled and forged bars, $7.55-$7.80.

ZINC

(Prices per lb, c.l., f.o.b. mill) Sheets, 24.00; ribbon zinc in coils, 21.50; plates, 20.00.

ZIRCONIUM

Plate, $22; H.R. strip, $19; C.R. strip, $29; forged or H.R. bars, $17; wire, 0.015 in., 1.00c per linear foot.

NICKEL, MONEL, INCONEL

	"A" Nickel	Monel	Inconel
Sheets, C.R.	102	83	99
Strip, C.R.	102	92	126
Plate, H.R.	97	87	95
Rod, Shapes, H.R.	87	74	93
Seamless Tubes	122	110	153

ALUMINUM

Screw Machine Stock: 30,000 lb base.

Diam.(in.)or across flats	Round 2011-T3	Round 2017-T4	Hexagonal 2011-T3	Hexagonal 2017-T4
Drawn				
0.125	59.4	57.9	...	...
0.156-0.172	59.0	57.4	...	...
0.188	59.0	57.4	...	73.2
0.219-0.234	56.0	54.4	...	...
0.250-0.281	56.0	54.4	...	69.9
0.313	56.0	54.4	...	66.7
Cold-finished				
0.375-0.547	54.9	52.9	65.2	62.8
0.563-0.688	54.9	52.9	62.1	59.0
0.750-1.000	53.6	51.6	56.9	55.7
1.063	53.6	51.6	...	53.8
1.125-1.500	51.6	49.7	55.1	53.8
Rolled				
1.563	50.3	48.4	...	...
1.625-2.000	49.7	47.7	...	52.0
2.125-2.500	48.5	46.5	...	...
2.563-3.375	47.1	45.1	...	...

ALUMINUM

Sheets and Circles: 1100 and 3003 mill finish (30,000 lb base; freight allowed)

Thickness Range Inches	Flat Sheet	Flat Sheet Circles*	Coiled Sheet	Coiled Sheet Circles†
0.249-0.136	39.0	43.8	...	...
0.135-0.096	39.5	44.7	37.5	42.4
0.095-0.077	40.2	45.7	37.6	42.8
0.076-0.061	40.8	46.6	37.8	43.0
0.060-0.048	41.4	47.1	38.2	43.5
0.047-0.038	41.9	48.0	38.7	43.9
0.037-0.030	42.3	48.5	39.1	44.6
0.029-0.024	42.9	49.0	39.4	45.1
0.023-0.019	43.7	50.5	40.3	46.0
0.018-0.017	44.5	...	40.9	46.9
0.016-0.015	45.4	...	41.7	48.1
0 014	46.4	...	42.7	49.4
0.013-0.012	47.6	...	43.4	50.4
0.011	48.6	...	44.6	52.0
0.010-0.0095	49.9	...	45.8	53.7
0.009-0.0085	51.2	...	47.3	55.8
0.008-0.0075	52.8	...	48.5	57.6
0.007	54.3	...	50.0	59.9
0.006	55.9	...	51.4	64.9

*48 in. max diam. †26 in. max diam.

ALUMINUM

Plates and Circles: Thickness 0.250-3 in., 24-60 in. width or diam, 72-240 in. lengths.

Alloy	Plate Base	Circle Base
1100-F, 3003-F	38.0	42.3
5050-F	39.1	43.4
3004-F	40.1	45.3
5052-F	41.4	46.7
6061-T6	42.6	47.5
2024-T4*	45.1	51.4
7075-T6*	52.9	60.0

*24-48 in. widths or diam, 72-180 lengths.

ALUMINUM

Forging Stock: Round, Class 1, 40.60-51.60 in specific lengths 36-144 in. diameters 0.375-8 in. Rectangles and squares, Class 1, 44.50-57.70 in random lengths, 0.375-4 in. thick, width 0.750-10 in.

Pipe: ASA schedule 40, alloy 6063-T6, 20-ft length, plain ends, 90,000-lb base, per 100 ft.

Nom. Pipe Size(in.)		Nom. Pipe Size(in.)	
⅜	$17.45	2	$ 53.85
1	27.35	4	148.60
1¼	37.05	6	286.55
1½	44.30	8	401.10

MAGNESIUM

Sheet and Plate: AZ31A standard grade, .032 in., 100.00; .081 in., 75.00; .188 in., 66.50; .250-2.0 in., 65.60. AZ31A special grade, .032 in., 163.10; .081 in., 103.50; .188 in., 91.10; .250-2.0, 88.90. Tread plate, .188 in., 68.90; .250-2.0 in., 67.80. Tooling plate, .250-3.0 in., 70.20.

Extruded Solid Shapes:

Factor	Com. Grade (FS)	Spec. Grade (AZ31B)
0-8	66.40-69.00	81.40-84.00
12-14	67.50-69.60	82.50-84.60
24-26	72.10-72.70	87.10-87.70
36-38	84.90-85.80	99.90-100.80

NONFERROUS SCRAP

DEALERS BUYING PRICES

(Cents per pound, New York, in ton lots)

Aluminum: 1100 clippings, 14.50-15.00; old sheets, 10.50-11.00; borings and turnings, 6.00-7.00; crankcases, 10.50-11.00; industrial castings, 10.50-11.00.

Copper and Brass: No. 1 heavy copper and wire, 30.00-30.50; No. 2 heavy copper and wire, 27.50-28.00; light copper, 25.50-26.00; No. 1 composition red brass, 22.50-23.00; No. 1 composition turnings, 22.00-22.50; yellow brass

BRASS MILL PRICES

MILL PRODUCTS a — SCRAP ALLOWANCES f

	Sheet, Strip, Plate	Rod	Wire	Seamless Tube	Clean Heavy	Rod Ends	Clean Turnings
Copper	67.13b	64.36c	....	67.32	42.000	42.000	41.250
Yellow Brass	55.60	45.65d	58.14	58.51	31.250	31.000	29.000
Low Brass, 80%	60.15	60.09	60.69	62.96	35.375	35.125	34.625
Red Brass, 85%	61.79	61.73	62.33	64.60	37.000	36.750	36.250
Com. Bronze, 90%	63.98	63.92	64.52	66.54	38.500	38.250	37.750
Manganese Bronze	62.68	56.78	67.00	....	28.875	28.625	28.125
Munts Metal	56.94	52.75	....	....	29.125	28.875	28.375
Naval Brass	58.84	53.15	65.90	62.06	28.875	28.625	28.125
Silicon Bronze	70.48	69.67	70.52	75.59e	40.750	40.500	39.750
Nickel Silver, 10%	70.16	72.49g	72.49	....	35.625	35.375	17.813
Phos. Bronze, A, 5%	84.92	85.42	85.42	88.69	42.125	41.875	40.875

a. Cents per lb, f.o.b. mill; freight allowed on 500 lb or more. b. Hot-rolled. c. Cold-drawn. d. Free cutting. e. 3% silicon. f. Prices in cents per lb for less than 20,000 lb, f.o.b. shipping point. On lots over 20,000 lb at one time, of any or all kinds of scrap, add 1 cent per lb. g. Leaded

turnings, 13.00-13.50; new brass clippings, 22.50-23.00; light brass, 14.50-15.00; heavy yellow brass, 15.50-16.00; new brass rod ends, 20.50-21.00; auto radiators, unsweated, 16.50-17.00; cocks and faucets, 19.50; brass pipe, 18.00-18.50.

Lead: Heavy, 12.50-12.75; battery plates, 6.50-6.75; linotype and stereotype, 13.50-14.00; electrotype, 12.75-13.00; mixed babbitt, 14.50.

Monel: Clippings, 65.00-90.00; old sheets, 65.00-80.00; turnings 65.00-70.00; rods, 65.00-90.00.

Nickel: Sheets and clips, 100.00-200.00; rolled anodes, 100.00-200.00; turnings, 85.00-185.00; rod ends, 100.00-200.00.

Zinc: Old zinc, 5.00-5.50; new die-cast scrap, 4.00-4.50; old die-cast scrap, 3.00.

REFINER'S BUYING PRICES

(Cents per pound, carlots, delivered refinery)

Aluminum: 1100 clippings, 17.50-18.25; 3003 clippings, 17.50-18.00; 6151 clippings, 17.50-18.00; 5052 clippings, 17.50-18.00; 2014 clippings, 16.50-17.50; 2017 clippings, 16.50-17.50; 2024 clippings, 16.50-17.50; mixed clippings, 16.50; old sheet, 14.50-15.00; old cast, 14.50-15.00; clean old cable (free of steel), 16.75-17.50; borings and turnings, 14.50-15.50.

Beryllium Copper: Heavy scrap, 0.020-in. and heavier, not less than 1.5% Be, 68.00; light scrap, 63.00; turnings and borings, 48.00.

Copper and Brass: No. 1 heavy copper and wire, 33.50; No. 2 heavy copper and wire, 32.00; light copper, 30.25; refinery brass (60% copper) per dry copper content, 28.00-28.50.

INGOTMAKERS' BUYING PRICES

(Cents per pound, carlots, delivered)

Copper and Brass: No. 1 heavy copper and wire, 33.50; No. 2 heavy copper and wire, 32.00; light copper, 30.25; No. 1 composition borings, 25.00; No. 1 composition solids, 25.50; heavy yellow brass solids, 17.00; yellow brass turnings, 16.00; radiators, 19.00.

PLATING MATERIAL

(F.o.b. shipping point, freight allowed on quantities)

ANODES

Cadmium: Special or patented shapes, $1.70 per lb.

Copper: Flat-rolled, 63.79; oval, 62.92, 5000-10,000 lb; electrodeposited, 57.78, 2000-5000 lb lots; cast, 58.04-59.54, 5000-10,000 lb quantities.

Nickel: Depolarized, less than 100 lb, $1.015; 100-499 lb, 99.50; 500-4999 lb, 95.50; 5000-29,999 lb, 93.50; 30,000 lb, 91.50. Carbonized, deduct 3 cents a lb. All prices eastern delivery, effective Jan. 1, 1955.

Tin: Bar or slab, less than 200 lb, 113.50; 200-499 lb, 112.00; 500-999 lb, 111.50; 1000 lb or more, 111.00.

Zinc: Balls, 21.00; flat tops, 21.00; flats, 22.75; ovals, 22.00, ton lots.

CHEMICALS

Cadmium Oxide: $2.15 per lb, in 100-lb drums.

Chromic Acid: Less than 10,000 lb, 28.50; over 10,000 lb, 27.50.

Copper Cyanide: 100 lb, 85.25; 200 lb, 84.50; 300 lb, 84.25; 400-900 lb, 83.50; 1000 lb, 81.50.

Copper Sulphate: 500-1900 lb, 17.90; 2000-5900 lb, 15.90; 6000 lb or more, 15.65.

Nickel Chloride: 100 lb, 46.50; 200 lb, 44.50; 300 lb, 43.50; 400-4900 lb, 41.50; 5000-9900 lb, 39.50; 10,000 lb and over, 38.50. All prices eastern delivery, effective Jan. 1, 1955.

Nickel Sulphate: 100 lb, 38.25; 200 lb, 36.25; 300 lb, 35.25; 400-4900 lb, 33.25; 5000-35,900 lb, 31.25; 36,000 lb, 30.35. All prices eastern delivery, effective Jan. 1, 1955.

Silver Cyanide: (Cents per ounce) 4-oz bottle, 86.875; 15-oz bottle, 85.625; 80-oz bottle, 83.125; 100-oz bottle, 83.125; f.o.b. St. Louis, New York and Los Angeles. Effective Sept. 30, 1955.

Sodium Cyanide: Egg, under 1000 lb, 19.80; 1000-19,900 lb, 18.80; 20,000 lb, and over, 17.80; granular, add 1-cent premium to above.

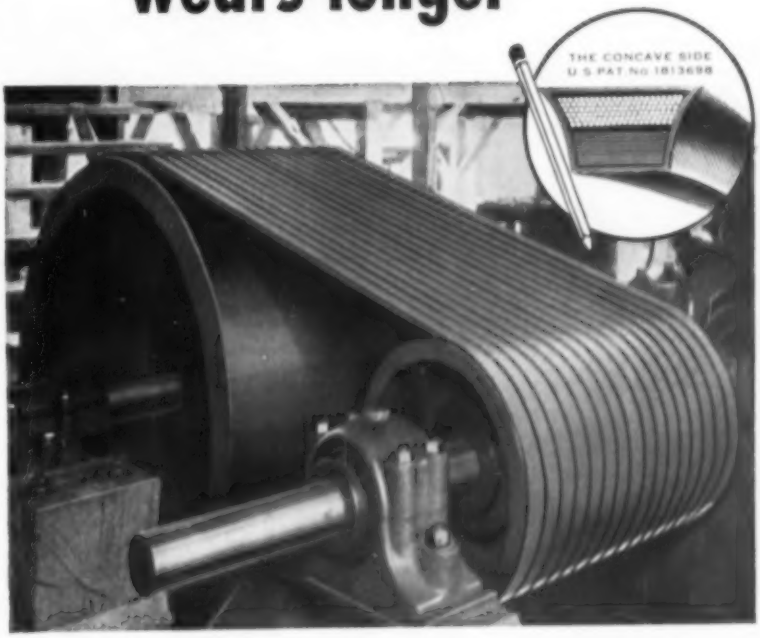
Sodium Stannate: Less than 100 lb, 68.90; 100-600 lb, 60.70; 700-1900 lb, 58.20; 2000-9900 lb, 56.50; 10,000 lb or more, 55.30.

Stannous Chloride (anhydrous): Less than 25 lb, 165.30; 25 lb, 130.30; 100 lb, 115.30; 400 lb, 112.90; 5200-19,600 lb, 100.70; 20,000 lb or more, 88.50.

Stannous Sulphate: Less than 50 lb, 128.10; 50 lb, 98.10; 100-1900 lb, 96.10; 2000 lb or more, 94.10.

Zinc Cyanide: Under 1000 lb, 54.30; 1000 lb and over, 52.30.

Why a V-Belt with CONCAVE SIDES wears longer

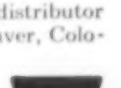


It is easy to demonstrate to yourself why the concave sides (Fig. 1) of the Gates belt greatly lengthen belt life.

Simply bend a Gates belt and feel the sides. Notice how these precisely engineered concave sides *fill out* on the bend and *become straight*. Thus a Gates belt grips the sheave groove evenly (Fig. 1-A) and wear is distributed uniformly across each side of the belt. That means longer belt life; lower costs.

Make the same test with a straight-sided belt (Fig. 2) and see what happens. The sides bulge out on the bend (Fig. 2-A) concentrating the wear at points shown by arrows.

To assure longer wear and keep belt costs down, specify the V-belt with Concave sides—Gates Vulco Rope . . . readily available from nearby distributor stocks. The Gates Rubber Company, Denver, Colorado—*World's Largest Maker of V-Belts.*



There are Gates Engineering Offices and Distributor Stocks in all industrial centers of the United States and Canada, and in 70 other countries throughout the world.

TPA 90

Gates VULCO ROPE Drives

Steel Prices

Mill prices as reported to STEEL, cents per pound except as otherwise noted. *Changes shown in italics.* Code numbers following mill points indicate producing company. Key to producers, page 169; to footnotes, page 171.

SEMIFINISHED

INGOTS, Carbon, Forging (NT)

Munhall,Pa. U5	$65.50

INGOTS, Alloy (NT)

Detroit R7	$69.00
Houston 85	74.00
Midland,Pa. C18	69.00
Munhall,Pa. U5	69.00

BILLETS, BLOOMS & SLABS

Carbon, Rerolling (NT)

Aliquippa,Pa. J5	$68.50
Bessemer,Pa. U5	68.50
Bridgeport,Conn. N19	73.50
Buffalo R2	68.50
Clairton,Pa. U5	68.50
Ensley,Ala. T2	68.50
Fairfield,Ala. T2	68.50
Fontana,Calif. K1	78.00
Gary,Ind. U5	68.50
Johnstown,Pa. B2	68.50
Lackawanna,N.Y. B2	68.50
LoneStar,Tex. L6	74.50
Munhall,Pa. U5	68.50
Pittsburgh J5	68.50
S.Chicago,Ill. R2, U5	68.50
S.Duquesne,Pa. U5	68.50
Youngstown R2	68.50

Carbon, Forging (NT)

Aliquippa,Pa. J5	$84.50
Bessemer,Pa. U5	84.50
Bridgeport,Conn. N19	89.50
Buffalo R2	84.50
Canton,O. R2	86.50
Clairton,Pa. U5	84.50
Conshohocken,Pa. A3	89.50
Ensley,Ala. T2	84.50
Fairfield,Ala. T2	84.50
Fontana,Calif. K1	94.00
Gary,Ind. U5	84.50
Geneva,Utah C11	84.50
Houston 85	101.00
Johnstown,Pa. B2	84.50
Lackawanna,N.Y. B2	84.50
LosAngeles B3	94.00
Midland,Pa. C18	84.50
Munhall,Pa. U5	84.50
Pittsburgh J5	84.50
Seattle B3	98.00
S.Chicago R2,U5,W14	84.50
S.Duquesne,Pa. U5	84.50
S.SanFrancisco B3	94.00

Alloy, Forging (NT)

Bethlehem,Pa. B2	$96.00
Buffalo R2	96.00
Canton,O. R2, T7	96.00
Conshohocken,Pa. A3	103.00
Detroit R7	96.00
Fontana,Calif. K1	117.00
Gary,Ind. U5	96.00
Houston 85	105.00
Ind.Harbor,Ind. Y1	96.00
Johnstown,Pa. B2	96.00
Lackawanna,N.Y. B2	96.00
LosAngeles B3	116.00
Massillon,O. R2	96.00
Midland,Pa. C18	96.00
Munhall,Pa. U5	96.00
S.Chicago R2,U5,W14	96.00
S.Duquesne,Pa. U5	96.00
Struthers,O. Y1	96.00
Warren,O. C17	96.00

ROUNDS, SEAMLESS TUBE (NT)

Buffalo R2	$103.50
Canton,O. R2	103.50
Cleveland R2	103.50
Gary,Ind. U5	103.50
S.Chicago R2, W14	103.50
S.Duquesne,Pa. U5	103.50

SKELP

Aliquippa,Pa. J5	4.325
LoneStar,Tex. L6	4.625
Munhall,Pa. U5	4.225
SparrowsPoint,Md. B2	4.225
Warren,O. R2	4.225
Youngstown R2, U5	4.225

WIRE RODS

AlabamaCity,Ala. R2	5.375
Aliquippa,Pa. J5	5.375
Alton,Ill. L1	5.55
Buffalo W12	5.375
Cleveland A7	5.375
Donora,Pa. A7	5.375
Fairfield,Ala. T2	5.375
Houston 85	5.625
IndianaHarbor,Ind. Y1	5.375
Johnstown,Pa. B2	5.375
Joliet,Ill. A7	5.375
KansasCity,Mo. 85	5.625
Kokomo,Ind. C16	5.475
Los Angeles B2	6.175
Minnequa,Colo. C10	5.625
Monessen,Pa. P7	5.375
N.Tonawanda,N.Y. B11	5.375
Pittsburg,Calif. C11	6.025
Portsmouth,O. P12	5.375
Roebling,N.J. R5	5.475
S.Chicago,Ill. R2	5.375
SparrowsPoint,Md. B2	5.475
Sterling,Ill.(1) N15	5.375
Sterling,Ill. N15	5.475
Struthers,O. Y1	5.375
Worcester,Mass. A7	5.675

STRUCTURALS

Carbon Steel Std. Shapes

Ala.City,Ala. R2	4.60
Aliquippa,Pa. J5	4.60
Bessemer,Ala. T2	4.60
Bethlehem,Pa. B2	4.65
Birmingham C15	5.10
Clairton,Pa. U5	4.60
Fairfield,Ala. T2	4.60
Fontana,Calif. K1	5.30
Gary,Ind. U5	4.60
Geneva,Utah C11	4.60
Houston 85	4.70
Ind.Harbor,Ind. I-2	4.60
Johnstown,Pa. B2	4.65
KansasCity,Mo. 85	4.70
Lackawanna,N.Y. B2	4.65
LosAngeles B3	5.30
Minnequa,Colo. C10	4.90
Munhall,Pa. U5	4.60
Niles,Calif. P1	5.25
Phoenixville,Pa. P4	5.15
Portland,Oreg. O4	5.35
Seattle B3	5.35
S.Chicago U5, W14	4.60
S.SanFrancisco B3	5.25
Torrance,Calif. C11	5.30
Weirton,W.Va. W6	4.60

Wide Flange

Bethlehem,Pa. B2	4.65
Clairton,Pa. U5	4.60
Fontana,Calif. K1	5.45
Lackawanna,N.Y. B2	4.65
Munhall,Pa. U5	4.60
Phoenixville,Pa. P4	5.15
S.Chicago,Ill. U5	4.60

Alloy Std. Shapes

Clairton,Pa. U5	5.65
Fontana,Calif. K1	7.40
Gary,Ind. U5	5.65
Houston 85	5.75
Munhall,Pa. U5	5.65
S.Chicago,Ill. U5	5.85

H.S., L.A. Std. Shapes

Aliquippa,Pa. J5	6.75
Bessemer,Ala. T2	6.75
Bethlehem,Pa. B2	6.80
Clairton,Pa. U5	6.75
Fairfield,Ala. T2	6.75
Fontana,Calif. K1	7.45
Gary,Ind. U5	6.75
Geneva,Utah C11	6.75
Houston 85	6.85
Ind.Harbor,Ind. I-2, Y1	6.75
Johnstown,Pa. B2	6.80
KansasCity,Mo. 85	6.85
Lackawanna,N.Y. B2	6.80
LosAngeles B3	7.45
Munhall,Pa. U5	6.75
Seattle B3	7.50
S.Chicago,Ill. U5, W14	6.75
S.SanFrancisco B3	7.40
Struthers,O. Y1	6.75

H.S., L.A. Wide Flange

Bethlehem,Pa. B2	6.80
Lackawanna,N.Y. B2	6.80
Munhall,Pa. U5	6.75
S.Chicago,Ill. U5	6.75

PILING

BEARING PILES

Bethlehem,Pa. B2	4.65
Lackawanna,N.Y. B2	4.65
Munhall,Pa. U5	4.60
S.Chicago,Ill. U5	4.60

STEEL SHEET PILING

Ind.Harbor,Ind. I-2	5.45
Lackawanna,N.Y. B2	5.45
Munhall,Pa. U5	5.45
S.Chicago,Ill. U5	5.45

PLATES

PLATES, Carbon Steel

Ala.City,Ala. R2	4.50
Aliquippa,Pa. J5	4.50
Ashland,Ky.(15) A10	4.50
Bessemer,Ala. T2	4.50
Bridgeport,Conn. N19	4.75
Buffalo R2	4.50
Clairton,Pa. U5	4.50
Claymont,Del. C22	5.35
Cleveland J5, R2	4.60
Coatesville,Pa. L7	4.80
Conshohocken,Pa. A3	4.50
Detroit M1	4.60
Ecorse,Mich. G5	4.60
Fairfield,Ala. T2	4.50
Fontana,Calif.(30) K1	5.20
Gary,Ind. U5	4.50
Geneva,Utah C11	4.50
GraniteCity,Ill. G4	4.70
Harrisburg,Pa. P4	5.10
Houston 85	4.60
Ind.Harbor,Ind. I-2, Y1	4.50
Johnstown,Pa. B2	4.50
Lackawanna,N.Y. B2	4.50
LoneStar,Tex. L6	4.85
Mansfield,O. E6	4.50
Minnequa,Colo. C10	5.35
Munhall,Pa. U5	4.50
Newport,Ky. N9	4.50
Pittsburgh J5	4.50
Riverdale,Ill. A1	4.725
Seattle B3	5.40
Sharon,Pa. S3	4.50
S.Chicago R2, U5, W14	4.50
SparrowsPoint,Md. B2	4.50
Steubenville,O. W10	4.50
Warren,O. R2	4.50
Weirton,W.Va. W6	4.50
Youngstown R2, U5, Y1	4.50

PLATES, Carbon Abras. Resist.

Claymont,Del. C22	6.20
Fontana,Calif. K1	6.35
Geneva, Utah C11	5.65
Johnstown,Pa. B2	5.65
SparrowsPoint,Md. B2	5.65

PLATES, Wrought Iron

Economy,Pa. B14	10.40

PLATES, High-Strength Low-Alloy

Aliquippa,Pa. J5	6.725
Bessemer,Ala. T2	6.725
Clairton,Pa. U5	6.725
Cleveland J5, R2	6.725
Claymont,Del. C22	6.725
Coatesville,Pa. L7	7.025
Conshohocken,Pa. A3	6.725
Ecorse,Mich. G5	6.825
Fairfield,Ala. T2	6.725
Fontana,Calif.(30) K1	7.425
Gary,Ind. U5	6.725
Geneva,Utah C11	6.725
Houston 85	6.825
Ind.Harbor,Ind. I-2, Y1	6.725
Johnstown,Pa. B2	6.725
Munhall,Pa. U5	6.725
Pittsburgh J5	6.725
Seattle B3	7.625
Sharon,Pa. S3	6.725
S.Chicago,Ill. U5, W14	6.725
SparrowsPoint,Md. B2	6.725
Warren,O. R2	6.725
Youngstown U5, Y1	6.725

PLATES, Alloy

Bridgeport,Conn. N19	6.55
Claymont,Del. C22	6.30
Coatesville,Pa. L7	6.30
Fontana,Calif. K1	7.60
Gary,Ind. U5	6.30
Houston 85	6.40
Ind.Harbor,Ind. Y1	6.30
Johnstown,Pa. B2	6.30
Munhall,Pa. U5	6.30
Newport,Ky. N9	6.30
Seattle B3	7.20
Sharon,Pa. S3	6.30
S.Chicago,Ill. U5, W14	6.30
SparrowsPoint,Md. B2	6.30
Youngstown Y1	6.30

FLOOR PLATES

Cleveland J5	5.575
Conshohocken,Pa. A3	5.575
Harrisburg,Pa. P4	5.575
Ind.Harbor,Ind. I-2	5.575
Munhall,Pa. U5	5.575
S.Chicago,Ill. U5	5.575

PLATES, Ingot Iron

Ashland c.l. (15) A10	4.75
Ashland l.c.l. (15) A10	5.25
Cleveland c.l. R2	5.10
Warren,O. c.l. R2	5.10

BARS

BARS, Hot-Rolled Carbon (Merchant Quality)

Ala.City,Ala.(9) R2	4.65
Aliquippa,Pa.(9) J5	4.65
Alton,Ill. L1	4.85
Atlanta(9) A11	5.15
Bessemer,Ala.(9) T2	4.65
Birmingham C15	5.15
Bridgeport,Conn. N19	4.80
Buffalo(9) R2	4.65
Canton,O.(9) R2	4.75
Clairton,Pa.(9) U5	4.65
Cleveland(9) R2	4.65
Ecorse,Mich.(9) G5	4.75
Emeryville,Calif. J7	5.40
Fairfield,Ala.(9) T2	4.65
Fairless,Pa.(9) U5	4.80
Fontana,Calif. K1	5.35
Gary,Ind.(9) U5	4.65
Houston(9) 85	4.90
Ind.Harbor,Ind.(9) I-2	4.65
Ind.Harbor,Ind. Y1	4.65
Johnstown,Pa.(9) B2	4.65
Joliet,Ill. P22	5.15
KansasCity,Mo.(9) 85	4.90
Lackawanna(9) B2	4.65
LosAngeles(9) B3	5.35
Massillon,O.(9) R2	4.75
Midland,Pa.(9) C18	4.65
Milton,Pa. M18	4.80
Minnequa,Colo. C10	5.10
Niles,Calif. P1	5.35
N.Tonawanda,N.Y.(9) B11	4.65
Pittsburg,Calif.(9) C11	5.35
Pittsburgh(9) J5	4.65
Portland,Oreg. O4	5.40
Seattle B3, N14	5.40
S.Chicago W14	4.65
S.Chicago,Ill.(9) R2, U5	4.65
S.Duquesne,Pa.(9) U5	4.65
S.SanFran.,Calif.(9) B3	5.40
Sterling,Ill.(1) N15	4.65
Sterling,Ill. N15	4.75
Struthers,O. Y1	4.65
Torrance,Calif.(9) C11	5.35
Warren,O.(9) R2	4.65
Weirton,W.Va.(9) W6	4.65
Youngstown(9) R2, U5	4.65

BARS, H.R. Leaded Alloy

Warren,O. C17	6.575

BARS, Hot-Rolled Alloy

Bethlehem,Pa. B2	5.575
Bridgeport,Conn. N19	5.725
Buffalo R2	5.575
Canton,O. R2, T7	5.575
Clairton,Pa. U5	5.575
Detroit R7	5.575
Ecorse,Mich.G5	5.675
Fairless,Pa. U5	5.725
Fontana,Calif. K1	6.625
Gary,Ind. U5	5.575
Houston 85	5.825
Ind.Harbor,Ind. I-2, Y1	5.575
Johnstown,Pa. B2	5.575
KansasCity,Mo. 85	5.825
Lackawanna,N.Y. B2	5.575
LosAngeles B3	6.625
Massillon,O. R2	5.575
Midland,Pa. C18	5.575
S.Chicago R2, U5, W14	5.575
S.Duquesne,Pa. U5	5.575
Struthers,O. Y1	5.575
Warren,O. C17	5.575
Youngstown U5	5.575

BARS & SMALL SHAPES, H.R. High-Strength Low-Alloy

Aliquippa,Pa. J5	6.80
Bessemer,Ala. T2	6.80
Bethlehem,Pa. B2	6.80
Clairton,Pa. U5	6.80
Cleveland R2	6.80
Ecorse,Mich. G5	6.90
Fairfield,Ala. T2	6.80
Fontana,Calif. K1	7.50
Gary,Ind. U5	6.80
Houston 85	7.05
Ind.Harb.,Ind. I-2, Y1	6.80
Johnstown,Pa. B2	6.80
KansasCity,Mo. 85	7.05
Lackawanna,N.Y. B2	6.80
LosAngeles B3	7.50
Pittsburgh J5	6.80
Seattle B3	7.55
S.Chicago W14	6.80
S.Duquesne,Pa. U5	6.80
S.SanFrancisco B3	7.55
Struthers,O. Y1	6.80
Warren,O. R2	6.80
Youngstown U5	6.80

BAR SIZE ANGLES, H.R. Carbon

Bethlehem,Pa.(9) B2	4.80
Lackawanna(9) B2	4.65

BAR SIZE ANGLES, S. Shapes

Aliquippa,Pa. J5	4.65
Atlanta A11	5.15
Fontana,Calif. K1	5.35
Joliet,Ill. P22	5.10
Niles,Calif. P1	5.35
Pittsburgh J5	4.65
Portland,Oreg. O4	5.40
SanFrancisco S7	5.05

BAR SHAPES, Hot-Rolled Alloy

Clairton,Pa. U5	5.65
Gary,Ind. U5	5.65
Houston 85	5.90
KansasCity,Mo. 85	5.90
Youngstown U5	5.65

BAR SHAPES, C.F. Loaded Alloy

Ambridge,Pa. W18	8.325
Camden,N.J. P13	8.35
Chicago W18	8.325
Cleveland C20	8.325
Monaca,Pa. S17	8.325
Newark,N.J. W18	8.50
SpringCity,Pa. K3	8.30
Warren,O. C17	8.575

BARS, Cold-Finished Carbon

Ambridge,Pa. W18	6.25
BeaverFalls,Pa. M12,R2	6.25
Buffalo B5	6.30
Camden,N.J. P13	6.70
Carnegie,Pa. C12	6.25
Chicago W18	6.25
Cleveland A7, C20	6.25
Detroit B5, P17	6.45
Detroit R7	6.25
Donora,Pa. A7	6.25
Elyria,O. W8	6.25
FranklinPark, Ill. N5	6.25
Gary,Ind. R2	6.25
GreenBay,Wis. F7	6.25
Hammond,Ind. L2, M13	6.25
Hartford,Conn. R2	6.75
Harvey,Ill. B5	6.25
LosAngeles(49) S30	7.70
LosAngeles R2	7.70
Mansfield,Mass. B5	6.80
Massillon,O. R2, R8	6.25
Midland,Pa. C18	6.25
Monaca,Pa. S17	6.25
Newark,N.J. W18	6.70
NewCastle,Pa.(17) B4	6.25
Pittsburgh J5	6.25
Plymouth,Mich. P5	6.50
Putnam,Conn. W18	6.80
Readville,Mass. C14	6.80
S.Chicago,Ill. W14	6.25
SpringCity,Pa. K3	6.70
Struthers,O. Y1	6.25
Waukegan,Ill. A7	6.25
Worcester,Mass. W19	6.70
Youngstown F3, Y1	6.25

BARS, Cold-Finished Carbon (Turned and Ground)

Cumberland,Md.(5) C19	5.15

BARS, Cold-Finished Alloy

Ambridge,Pa. W18	7.425
BeaverFalls,Pa.M12,R2	7.425
Bethlehem,Pa. B2	7.425
Buffalo B5	7.425
Camden,N.J. P13	7.60
Canton,O. T7	7.425
Carnegie,Pa. C12	7.425
Chicago W18	7.425
Cleveland A7, C20	7.425
Detroit R7	7.425
Detroit B5, P17	7.625
Donora,Pa. A7	7.425
Elyria,O. W8	7.425
Gary,Ind. R2	7.425
GreenBay,Wis. F7	7.425
Hammond,Ind. L2, M13	7.425
Hartford,Conn. R2	7.725
Harvey,Ill. B5	7.425
Lackawanna,N.Y. B2	7.425
LosAngeles S30	9.10
Mansfield,Mass. B5	7.725
Massillon,O. R2, R8	7.425
Midland,Pa. C18	7.425
Monaca,Pa. S17	7.425
Newark,N.J. W18	7.60
Plymouth,Mich. P5	7.625
S.Chicago W14	7.425
SpringCity,Pa. K3	7.60
Struthers,O. Y1	7.425
Warren,O. C17	7.425
Waukegan,Ill. A7	7.425
Worcester,Mass. A7	7.725
Youngstown F3, Y1	7.425

BARS, Reinforcing (To Fabricators)

Ala.City,Ala. R2	4.65
Atlanta A11	5.15
Birmingham C15	5.15
Buffalo R2	4.65
Cleveland R2	4.65
Ecorse,Mich. G5	4.75
Emeryville,Calif. J7	5.40
Fairfield,Ala. T2	4.65
Fairless,Pa. U5	4.80
Fontana,Calif. K1	5.35
Ft.Worth,Tex.(42) T4	5.10
Gary,Ind. U5	4.65
Houston 85	4.90

Ind.Harbor,Ind. I-2, Y1 4.65
Johnstown,Pa. B2 4.65
Joliet,Ill. P22 5.15
KansasCity,Mo. S5 4.90
Lackawanna,N.Y. B2 4.65
LosAngeles B3 5.35
Milton,Pa. M18 4.80
Minnequa,Colo. C10 5.10
Niles,Calif. P1 5.35
Pittsburg,Calif. C11 5.35
Pittsburgh J5 4.65
Portland,Oreg. O4 5.40
SandSprings,Okla. S5 5.15
Seattle B3, N14 5.40
S.Chicago R2 4.65
S.Duquesne,Pa. U5 4.65
S.SanFrancisco B3 5.40
SparrowsPoint,Md. B2 4.65
Sterling,Ill.(1) N15 4.65
Sterling,Ill. N15 4.75
Struthers,O. Y1 4.65
Torrance,Calif. C11 5.35
Youngstown R2, U5 4.65

BARS, Reinforcing
(Fabricated; to Consumers)

Johnstown,Pa. ¼-1" B2 6.15
KansasCity,Kans. S5 6.45
Lackawanna,N.Y. B2 6.17
Marion,O. P11 6.15
Pittsburgh U8 6.17
Seattle B3, N14 6.60
SparrowsPt. ¼-1" B2 6.15
Williamsport,Pa. S19 6.00

RAIL STEEL BARS

ChicagoHts.(3) C2, I-2 4.65
ChicagoHts.(4) C2, I-2 4.65
Ft.Worth,Tex.(26) T4 5.10
Franklin,Pa.(3) F5 4.65
Franklin,Pa.(4) F5 4.65
JerseyShore,Pa.(4) J8 4.65
Marion,O.(3) P11 4.65
Moline,Ill.(3) R2 4.80
Tonawanda(3) B12 5.15
Tonawanda(4) B12 5.15
Williamsport,Pa.(3) S19 4.65

BARS, Wrought Iron

Economy,Pa.(S.R.)B14 11.50
Economy,Pa.(D.R.)B14 14.30
Economy(Staybolt)B14 14.65
McK.Rks.(S.R.) L5 11.50
McK.Rks.(D.R.) L5 16.00
McK.Rks.(Staybolt) L5 17.00

SHEETS

SHEETS, Hot-Rolled Steel
(18 Gage and Heavier)

Ala.City,Ala. R2 4.325
Allenport,Pa. P7 4.325
Ashland,Ky.(8) A10 4.325
Cleveland J5, R2 4.325
Conshohocken,Pa. A3 4.375
Detroit(8) M1 4.425
Dravosburg,Pa. U5 4.325
Ecorse,Mich. G5 4.425
Fairfield,Ala. T2 4.325
Fairless,Pa. U5 4.375
Fontana,Calif. K1 5.125
Gary,Ind. U5 4.325
Geneva,Utah C11 4.425
GraniteCity,Ill. G4 4.525
Ind.Harbor,Ind. I-2,Y1 4.325
Lackawanna,N.Y. B2 4.325
Mansfield,O. E6 (37) 4.325
Munhall,Pa. U5 4.325
Newport,Ky.(8) N9 4.325
Niles,O. M21 4.325
Pittsburg Calif. C11 5.025
Pittsburgh J5 4.325
Portsmouth,O. P12 4.325
Riverdale,Ill. A1 4.55
Sharon,Pa. S3 4.325
S.Chicago,Ill. W14 4.325
SparrowsPoint,Md. B2 4.325
Steubenville,O. W10 4.325
Warren,O. R2 4.325
Weirton,W.Va. W6 4.325
Youngstown U5, Y1 4.325

SHEETS, H.R., (19 Ga. & Lighter)

Ala.City,Ala. R2 5.625
Niles,O. M21 5.325

SHEETS, H.R. Alloy

Dravosburg,Pa. U5 7.20
Gary,Ind. U5 7.20
Ind.Harbor,Ind. Y1 7.20
Youngstown Y1, U5 7.20

SHEETS, H.R. (14 Ga. & Heavier)
High-Strength Low-Alloy

Cleveland J5, R2 6.375
Conshohocken,Pa. A3 6.425
Dravosburg,Pa. U5 6.375
Ecorse,Mich. G5 6.475
Fairfield,Ala. T2 6.375
Fairless,Pa. U5 6.425
Fontana,Calif. K1 7.175
Gary,Ind. U5 6.375
Ind.Harbor,Ind. I-2, Y1 6.375
Lackawanna(35) B2 6.375
Munhall,Pa. U5 6.375
Pittsburgh J5 6.375
Sharon,Pa. S3 6.375
S.Chicago,Ill. U5 6.375
SparrowsPoint(36) B2 6.375
Warren,O. R2 6.375
Youngstown U5, Y1 6.375

SHEETS, Hot-Rolled Ingot Iron
(18 Gage and Heavier)

Ashland,Ky.(8) A10 4.575
Ind.Harbor,Ind. I-2 4.575

SHEETS, Cold-Rolled Steel
(Commercial Quality)

Allenport,Pa. P7 5.325
Cleveland J5, R2 5.325
Conshohocken,Pa. A3 5.375
Dravosburg,Pa. U5 5.325
Detroit M1 5.325
Ecorse,Mich. G5 5.425
Fairfield,Ala. T2 5.325
Fairless,Pa. U5 5.375
Follansbee,W.Va. F4 5.325
Fontana,Calif. K1 6.525
Gary,Ind. U5 5.325
GraniteCity,Ill. G4 5.525
Ind.Harbor,Ind. I-2, Y1 5.325
Lackawanna,N.Y. B2 5.325
Mansfield,O. E6 5.325
Middletown,O. A10 5.325
Newport, Ky. N9 5.325
Pittsburg,Calif. C11 6.275
Pittsburgh J5 5.325
Portsmouth,O. P12 5.325
SparrowsPoint,Md. B2 5.325
Steubenville,O. W10 5.325
Warren,O. R2 5.325
Weirton,W.Va. W6 5.325
Youngstown Y1 5.325

SHEETS, Cold-Rolled
High-Strength Low-Alloy

Cleveland J5, R2 7.875
Dravosburg,Pa. U5 7.875
Ecorse,Mich. G5 7.975
Fairless,Pa. U5 7.925
Fontana,Calif. K1 9.075
Gary,Ind. U5 7.875
Indiana Harbor,Ind. Y1 7.875
Lackawanna(37) B2 7.875
Pittsburgh J5 7.875
SparrowsPoint(38) B2 7.875
Warren,O. R2 7.875
Weirton,W.Va. W6 7.875
Youngstown Y1 7.875

SHEETS, Cold-Rolled Ingot Iron

Middletown,O. A10 5.625

SHEETS, Culvert

(16 Gage)	Cu Alloy	Cu Fe
Ashland,Ky.	A10 6.90	
Canton,O.	R2 6.10	6.55
Dravosburg	U5 6.10	
Fairfield	T2 6.10	
Gary,Ind.	U5 6.10	6.35
Ind.Harbor	I-2 6.10	6.35
Kokomo,Ind.	C16 6.20	
MartinsFry.	W10 6.10	
Newport,Ky.	N9 6.10	6.35
Pitts.,Calif.	C11 6.85	
SparrowsPt.	B2 6.10	

SHEETS, Culvert—Pure Iron

Ashland,Ky. A10 7.15
Gary,Ind. U5 6.35
MartinsFry,O. W10 6.35

SHEETS, Galvanized Steel
Hot-Dipped

Ala.City,Ala. R2 5.85†
Ashland,Ky. A10 5.85†
Canton,O. R2 5.85†
Dover,O. R1 5.85†
Dravosburg,Pa. U5 5.85†
Fairfield,Ala. T2 5.85†
Gary,Ind. U5 5.85*
GraniteCity,Ill. G4 6.05
Ind.Harbor,Ind. I-2 5.85†
Kokomo,Ind. C16 5.90†
MartinsFerry,O. W10 5.85*
Middletown,O. A10 5.85†
Newport,Ky. N9 5.85†
Pittsburg,Calif. C11 6.60*
Pittsburgh J5 5.85†
SparrowsPt.,Md. B2 5.85†
Warren,O. R2 5.85†
Weirton,W.Va. W6 5.85*

*Continuous and noncontinuous. †Continuous. ‡Noncontinuous.

SHEETS, Wall Casing

Pontana,Calif. K1 6.625

SHEETS, Galvanized
High-Strength Low-Alloy

Dravosburg,Pa. U5 8.60
SparrowsPoint(39) B2 8.60

SHEETS, Galvannealed Steel

Canton,O. R2 6.25
Dravosburg,Pa. U5 6.25
Kokomo,Ind. C16 6.60
Newport,Ky. N9 6.25

SHEETS, Galvanized Ingot Iron
(Hot-dipped Continuous)

Ashland,Ky. A10 6.10
Middletown,O. A10 6.10

SHEETS, Electrogalvanized

Cleveland(28) R2 6.70
Niles,O.(28) R2 6.70
Weirton,W.Va. W6 6.55

SHEETS, Aluminum Coated

Butler,Pa. A10 (type 1) 8.50
Butler,Pa. A10 (type 2) 8.60

SHEETS, Enameling Iron

Ashland,Ky. A10 5.90
Cleveland R2 5.90
Dravosburg,Pa. U5 5.90
Gary,Ind. U5 5.90
GraniteCity,Ill. G4 6.10
Ind.Harbor,Ind. I-2 5.90
Middletown,O. A10 5.90
Niles,O. M21 5.90
Youngstown Y1 5.90

BLUED STOCK, 29 Gage

Follansbee,W.Va. F4 7.75
Ind.Harbor,Ind. I-2 7.75
Yorkville,O. W10 7.75

SHEETS, Long Terne Steel
(Commercial Quality)

BeechBottom,W.Va. W10 6.25
Gary,Ind. U5 6.25
Mansfield,O. E6 6.25
Middletown,O. A10 6.25
Niles,O. M21 6.25
Weirton,W.Va. W6 6.25

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10 6.65

Key To Producers

A1 Acme Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A5 Alloy Metal Wire Div., H. K. Porter Co. Inc.
A6 American Shim Steel Co.
A7 American Steel & Wire Div., U. S. Steel Corp.
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.

B1 Babcock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B8 Braeburn Alloy Steel
B9 Brainard Steel Div., Sharon Steel Corp.
B10 E. & G. Brooke, Wickwire Spencer Steel Div. Colo. Fuel & Iron
B11 Buffalo Bolt Co., Div., Buffalo-Eclipse Corp.
B12 Buffalo Steel Corp.
B14 A. M. Byers Co.
B15 J. Bishop & Co.

C1 Calstrip Steel Corp.
C2 Calumet Steel Div. Borg-Warner Corp.
C4 Carpenter Steel Co.
C7 Cleve. Cold Rolling Mills
C8 Cold Metal Products Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel
C12 Columbia Steel & Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft.
C15 Connors Steel Div. H. K. Porter Co. Inc.
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Steel Products Dept. Wickwire Spencer Steel Division
C23 Charter Wire Inc.
C24 G. O. Carlson Inc.

D2 Detroit Steel Corp.
D3 Detroit Tube & Steel Div., Sharon Steel Corp.
D4 Disston & Sons, Henry
D6 Driver-Harris Co.
D7 Dickson Weatherproof Nail Co.
D8 Damascus Tube Co.
D9 Wilbur B. Driver Co.

E1 Eastern Gas& Fuel Assoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Corp.

F2 Firth Sterling Inc.
F3 Fitzsimmons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div. Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire
F8 Ft. Wayne Metals Inc.

G2 Globe Iron Co.
G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.

H1 Hanna Furnace Corp.
H7 Helical Tube Co.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.
I-6 Ivins, E., Steel Tube
I-7 Indiana Steel & Wire Co.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K7 Kenmore Metals Corp.

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L5 Lockhart Iron & Steel
L6 Lone Star Steel Co.
L7 Lukens Steel Co.

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M6 Mercer Pipe Div., Sawhill Tubular Products
M8 Mid-States Steel & Wire
M12 Moltrup Steel Products
M13 Monarch Steel Div., Jones & Laughlin Steel Corp.
M14 McInnes Steel Co.
M16 Md. Fine&Special. Wire
M17 Metal Forming Corp.
M18 Milton Steel Prod., Div. Merritt-Chapman&Scott
M21 Mallory-Sharon Titanium Corp.

N1 National-Standard Co.
N2 National Supply Co.
N3 National Tube Div. U. S. Steel Corp.
N5 Nelson Steel & Wire Co.
N6 New Eng. High Carb. Wire
N8 Newman-Crosby Steel
N9 Newport Steel Corp.
N14 Northwest SteelRoll. Mills
N15 Northwestern S.&W. Co.
N16 New Delphos Mfg. Co.
N19 Northeastern Steel Corp.
O3 Oliver Iron & Steel Corp.
O4 Oregon Steel Mills

P1 PacificStatesSteelCorp.
P2 Pacific Tube Co.
P4 Phoenix Iron & Steel Co. Sub. of Barium Steel Corp.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke&Chem.
P7 Pittsburgh Steel Co.
P11 Pollak Steel Co.
P12 Portsmouth Division, Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburg Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Co.
P19 Pitts. Rolling Mills
P20 Prod. Steel Strip Corp.
P22 Phoenix Mfg. Co.

R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R7 Rotary Electric Steel Co.
R8 Reliance Div.,Eaton Mfg.
R9 Rome Mfg. Co.
R10 Rodney Metals Inc.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S4 Sharon Tube Co.
S5 Sheffield Steel Div., Armco Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S12 Spencer Wire Corp.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S17 Superior DrawnSteelCo.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
S20 Southern States Steel
S23 Superior Tube Co.
S25 Stainless Welded Prod.
S26 Specialty Wire Co. Inc.
S30 Sierra Drawn Steel Corp.
S40 Seneca Steel Service

T2 Tenn. Coal & Iron Div., U. S. Steel Corp.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Strip Division, Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div. Am. Rad. & Stan. San.
T13 Tube Methods Inc.

U4 Universal-Cyclops Steel
U5 United States Steel Corp.
U6 U. S. Pipe & Foundry
U7 Ulbrich Stainless Steels
U8 U. S. Steel Supply Div. U. S. Steel Corp.

V2 Vanadium-Alloys Steel
V3 Vulcan Crucible Div., H. K. Porter Co. Inc.

W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W7 W. Va. Steel & Mfg. Co.
W8 Western Automatic Machine Screw Co.
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div., International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.
W19 Worcester Pressed Steel

Y1 Youngstown Sheet&Tube

STRIP

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2	4.325
Allenport,Pa. P7	4.325
Alton,Ill. L1	4.50
Ashland,Ky.(8) A10	4.325
Atlanta A11	4.525
Bessemer,Ala. T2	4.325
Birmingham C15	4.825
Bridgeport,Conn. N19	4.625
Buffalo(27) R2	4.325
Conshohocken,Pa. A3	4.375
Detroit M1	4.425
Ecorse,Mich. G5	4.425
Fairfield,Ala. T2	4.325
Fontana,Calif. K1	5.125
Gary,Ind. U5	4.325
Ind.Harbor,Ind. I-2,Y1	4.325
Johnstown,Pa.(25) B2	4.325
Lackaw'na,N.Y.(24) B2	4.325
LosAngeles(25) B3	5.075
Milton,Pa. M18	4.325
Minnequa,Colo. C10	5.425
Pittsburg,Calif. C11	5.075
Riverdale,Ill. A1	4.55
SanFrancisco S7	5.05
Seattle(25) B3	5.325
Seattle N14	5.40
Sharon,Pa. S3	4.325
S.Chicago,Ill. W14	4.325
S.SanFrancisco(25) B3	5.075
SparrowsPoint,Md. B2	4.325
Sterling(1) N15	4.325
Sterling,Ill. N15	4.425
Torrance,Calif. C11	5.075
Warren,O. R2	4.325
Weirton,W.Va. W6	4.325
Youngstown U8	4.325

STRIP, Hot-Rolled Alloy

Bridgeport,Conn. N19	7.50
Carnegie,Pa. S18	7.20
Fontana,Calif. K1	8.95
Gary,Ind. U5	7.20
Ind.Harbor,Ind. Y1	7.20
LosAngeles B3	8.40
Newport,Ky. N9	7.20
Sharon,Pa. S3	7.20
S.Chicago W14	7.20
Youngstown U5, Y1	7.20

STRIP, Hot-Rolled High-Strength Low-Alloy

Bessemer,Ala. T2	6.425
Conshohocken,Pa. A3	6.425
Ecorse,Mich. G5	6.525
Fairfield,Ala. T2	6.425
Fontana,Calif. K1	7.575
Gary,Ind. U5	6.425
Houston S5	6.675
Ind.Harbor,Ind. I-2,Y1	6.425
KansasCity,Mo. S5	6.675
Lackawanna,N.Y. B2	6.425
LosAngeles(25) B3	7.175
Seattle(25) B3	7.425
Sharon,Pa. S3	6.425
S.SanFrancisco(25) B3	7.175
SparrowsPoint,Md. B2	6.425
Warren,O. R2	6.425
Weirton,W.Va. W6	6.425
Youngstown U5, Y1	6.425

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10	4.575

STRIP, Cold-Rolled Carbon

Anderson,Ind. G6	6.25
Baltimore T6	6.25
Boston T6	6.80
Buffalo S40	6.25
Cleveland A7, J5	6.25
Conshohocken,Pa. A3	6.30
Dearborn,Mich. D3	6.35
Detroit D2, M1, P20	6.35
Dover,O. G6	6.25
Ecorse,Mich. G5	6.35
Follansbee,W.Va. F4	6.25
Fontana,Calif. K1	8.00
FranklinPark,Ill. T6	6.35
Ind.Harbor,Ind. I-2	6.35
Ind.Harbor,Ind. Y-1	6.25
Indianapolis C8	6.40
Lackawanna,N.Y. B2	6.25
LosAngeles C1	8.30
NewBedford,Mass. R19	6.70
NewBritain(10) B15	6.25
NewCastle,Pa. B4, E5	6.25
NewHaven,Conn. A7, D2	6.70
NewKensington,Pa. A6	6.25
Pawtucket,R.I. R3	6.90
Pawtucket,R.I. N8	6.80
Pittsburgh J8	6.25
Riverdale,Ill. A1	6.35
Rome,N.Y.(32) R6	6.25
Sharon,Pa. S3	6.25
SparrowsPt.,Md. B2	6.25
Trenton,N.J.(31) R5	7.80
Wallingford,Conn. W2	6.70
Warren,O. R2, T5	6.25
Weirton,W.Va. W6	6.25
Worcester,Mass. A7	6.80
Youngstown C8, Y1	6.25

STRIP, Cold-Rolled Alloy

Boston T6	13.80
Carnegie,Pa. S18	13.45
Cleveland A7	13.45
Dover,O. G6	13.45
FranklinPark,Ill. T6	13.45
Harrison,N.J. C18	13.45
Indianapolis C8	13.60
Pawtucket,R.I. N8	13.80
Sharon,Pa. S3	13.45
Worcester,Mass. A7	13.75
Youngstown C8	13.45

STRIP, Cold-Rolled High-Strength, Low-Alloy

Cleveland A7	9.10
Dearborn,Mich. D3	9.20
Dover,O. G6	9.30
Ecorse,Mich. G5	9.20
Ind.Harbor,Ind. Y1	9.30

STRIP, Cold-Finished Spring Steel (Annealed)	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Baltimore T6	7.40	9.35	10.90	13.05	15.75
Boston T6	7.65	9.35	10.90	13.05	15.75
Bristol,Conn. W1	...	...	10.90	13.05	15.75
Carnegie,Pa. S18	...	9.05	10.60	12.75	....
Cleveland A7	7.10	9.05	10.60	12.75	15.45
Cleveland C7	...	9.05	10.60	12.75	15.45
Dearborn,Mich. D3	7.20	9.15	10.70	....	....
Detroit D2	7.20	9.15	10.70	12.85	....
Dover,O. G6	7.10	9.05	10.60	12.75	15.45
FranklinPark,Ill. T6	7.20	9.05	10.60	12.75	15.45
Harrison,N.J. C18	...	...	10.90	13.05	15.75
Indianapolis C8	7.25	9.20	10.60	12.75	15.45
NewBritain,Conn.(10) S15	7.10	9.05	10.60	12.75	15.45
NewCastle,Pa. B4, E5	7.10	9.05	10.60	12.75	....
NewHaven,Conn. D2	7.55	9.35	10.90	13.05	....
NewKensington,Pa. A6	7.10	9.05	10.60	....	....
NewYork W3	...	9.35	10.90	13.05	15.75
Pawtucket,R.I. N8	7.65	9.35	10.90	13.05	15.75
Riverdale,Ill. A1	7.20	9.05	10.60	12.75	15.45
Rome,N.Y.(32) R6	7.10	9.05	10.60	12.75	15.45
Sharon,Pa. S3	7.10	9.05	10.60	12.75	15.45
Trenton,N.J. R5	...	9.35	10.90	13.05	15.75
Wallingford,Conn. W2	7.55	9.35	10.90	13.05	15.75
Warren,O. T5	7.10	9.05	10.60	12.75	15.45
Weirton,W.Va. W6	7.10	9.05	10.60	12.75	15.45
Worcester,Mass. A7, T6	7.65	9.35	10.90	13.05	15.75
Youngstown C8	7.10	9.05	10.60	12.75	15.45
Spring Steel (Tempered)					
Bristol,Conn. W1	...	...	14.80	18.15	....
Buffalo W12	...	...	14.80	...	....
FranklinPark,Ill. T6	...	...	15.15	18.50	22.35
Harrison,N.J. C18	...	...	14.80	18.15	22.00
NewYork W3	...	...	14.80	18.15	22.00
Trenton,N.J. R5	...	...	14.80	18.15	22.00
Worcester,Mass. W12	...	...	14.80	...	....
Worcester,Mass. A7, T6	...	...	14.80	18.15	22.00
Youngstown C8	...	...	15.15	18.50	22.35

STRIP, Galvanized (Continuous)

Sharon,Pa. S3	6.55

TIGHT COOPERAGE HOOP

Atlanta A11	5.05
Riverdale,Ill. A1	4.90
Sharon,Pa. S3	4.75
Youngstown U5	4.75

STRIP, Electrogalvanized

Cleveland A7	6.25*
Dover,O. G6	6.25*
Riverdale,Ill. A1	6.35*
Warren,O. B9, T5	6.25*
Worcester,Mass. A7	6.80*
Youngstown C8	6.25*

*Plus galvanizing extras.

SILICON STEEL

H.R. SHEETS(22 Ga.,cut lengths)	Field	Armature	Electric	Motor	Dynamo
BeechBottom,W.Va. W10	...	...	9.95	10.95	11.85
Brackenridge,Pa. A4	...	...	9.95	10.95	11.85
Mansfield,O. E6	8.40	9.35	9.95	10.95	11.85
Newport,Ky. N9	8.40	9.35	9.95	10.95	11.85
Niles,O. M21	8.40	9.35	9.95	10.95	....
Vandergrift,Pa. U5	...	9.35	9.95	10.95	11.85
Warren,O. R2	8.40	9.35	9.95	10.95	11.85
Zanesville,O. A10	...	9.35	9.95	10.95	11.85

C.R. COILS & CUT LENGTHS, (22 Ga.)

Fully Processed (Semiprocessed ½c lower)	Field	Armature	Electric	Motor	Dynamo
Brackenridge,Pa. A4	...	...	10.70	11.70	12.60
GraniteCity,Ill. G4	8.80*	9.80*	10.40*	11.40*	....
IndianaHarbor,Ind. I-2	8.60†	9.60*	10.20*	11.20*	....
Vandergrift,Pa. U5	8.60*	9.60*	10.20*	11.20*	12.10*
Vandergrift,Pa. U8	...	10.10†	10.70†	11.70†	12.60†
Warren,O. R2	8.60†	10.10	10.70	11.70	12.60

H.R. SHEETS (22 Ga., cut lengths)	Transformer Grade T-72	T-65	T-58	T-52
BeechBottom,W.Va. W10	12.80	13.35	13.85	14.85
Brackenridge,Pa. A4	12.80	....	....	....
Newport,Ky. N9	12.80	....	....	....
Vandergrift,Pa. U5	12.80	13.35	13.85	14.85
Zanesville,O. A10	12.80§	13.35§	13.85§	14.85§

C.R. COILS & CUT LENGTHS (22 Ga.)	Grain Oriented T-100	T-90	T-80	T-73	T-66	T-72
Brackenridge,Pa. A4	....	15.85	17.45	17.95	18.45	13.55**
Butler,Pa. A10	....	....	17.45	17.95	....	....
Vandergrift,Pa. U5	14.85	15.85	17.45	17.95	....	13.55
Warren,O. R2	....	....	....	....	....	13.55†

*Semiprocessed. †Fully processed only. ‡Coils, annealed, semiprocessed ½c lower. §Coils, ¾-cent higher. **Cut lengths, ¾-cent lower.

TIN MILL PRODUCTS

TIN PLATE Electrolytic (Base Box)	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$8.30	$8.55	$8.95
Dravosburg,Pa. U5	8.30	8.55	8.95
Fairfield,Ala. T2	8.40	8.65	9.05
Fontana,Calif. K1	9.05	9.30	9.70
Fairless,Pa. U5	8.40	8.65	9.05
Gary,Ind. U5	8.30	8.55	8.95
GraniteCity,Ill. G4	8.40	8.65	9.05
IndianaHarbor,Ind. I-2, Y-1	8.30	8.55	8.95
Niles,O. R2	8.30	8.55	8.95
Pittsburg,Calif. C11	9.05	9.30	9.70
SparrowsPoint,Md. B2	8.40	8.65	9.05
Weirton,W.Va. W6	8.30	8.55	8.95
Yorkville,O. W10	8.30	8.55	8.95

ELECTROTIN (22-27 Gage; Dollars per 100 lb)

Aliquippa,Pa. J5	6.975	....	....
Niles,O. R2	6.975	7.175	7.375

TINPLATE, American	1.25 lb	1.50 lb
Aliquippa,Pa. J5	$9.60	$9.85
Dravosburg,Pa. U5	9.60	9.85
Fairfield,Ala. T2	9.70	9.95
Fairless,Pa. U5	9.70	9.95
Fontana,Calif. K1	10.35	10.60
Gary,Ind. U5	9.60	9.85
Ind.Har. I-2, Y1	9.60	9.85
Pitts.,Calif. C11	10.35	10.60
Sp.Pt.,Md. B2	9.70	9.95
Weirton,W.Va. W6	9.60	9.85
Yorkville,O. W10	9.60	9.85

BLACK PLATE (Base Box)

Aliquippa,Pa. J5	$7.40
Dravosburg,Pa. U5	7.40
Fairfield,Ala. T2	7.50
Fairless,Pa. U5	7.50
Fontana,Calif. K1	8.15
Gary,Ind. U5	7.40
GraniteCity,Ill. G4	7.50
Ind.Harbor,Ind. I-2, Y1	7.40
Niles,O. R2	7.40
Pittsburg,Calif. C11	8.15
SparrowsPoint,Md. B2	7.50
Warren,O. R2	7.40
Weirton,W.Va. W6	7.40
Yorkville,O. W10	7.40

HOLLOWARE ENAMELING Black Plate (29 Gage)

Dravosburg,Pa. U5	6.65
Gary,Ind. U5	6.65
GraniteCity, Ill. G4	6.75
Ind.Harbor,Ind. Y1	6.65
Yorkville,O. W10	6.65

MANUFACTURING TERNES (Special Coated; Base Box)

Dravosburg,Pa. U5	$9.10
Gary,Ind. U5	9.10
Yorkville,O. W10	9.10

MANUFACTURING TERNES (Light Coated, 6 lb; Base Box)

Yorkville,O. W10	$9.55

ROOFING SHORT TERNES (8 lb Coated; Base Box)

Gary,Ind. U5	$10.65

WIRE

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala. R2	6.60
Aliquippa,Pa. J5	6.60
Alton,Ill. L1	6.775
Atlanta A11	6.80
Bartonville,Ill. K4	6.70
Buffalo W12	6.60
Chicago W13	6.60
Cleveland A7	6.60
Crawfordsville,Ind. M8	6.70
Donora,Pa. A7	6.60
Duluth,Minn. A7	6.60
Fairfield,Ala. T2	6.60
Fostoria,O. (24) S1	6.80
Houston S5	6.85
Jacksonville,Fla. M8	6.95
Johnstown,Pa. B2	6.60
Joliet,Ill. A7	6.60
KansasCity,Mo. S5	6.85
Kokomo,Ind. C16	6.70
LosAngeles B3	7.55
Minnequa,Colo. C10	6.85
Monessen,Pa. P7	6.60
Newark 6-8 ga. I-1	6.90
N.Tonawanda B11	6.60
Palmer,Mass. W12	6.90
Pittsburg,Calif. C11	7.55
Portsmouth,O. P12	6.60
Rankin,Pa. A7	6.60
S.Chicago,Ill. R2	6.60
S.SanFrancisco C10	7.55
SparrowsPoint,Md. B2	6.70
Sterling,Ill.(1) N15	6.60
Sterling,Ill. N15	6.70
Struthers,O. Y1	6.60
Waukegan,Ill. A7	6.60
Worcester,Mass. A7	6.90

WIRE, MB Spring, High Carbon

Aliquippa,Pa. J5	7.90
Alton,Ill. L1	8.075
Bartonville,Ill. K4	8.00
Buffalo W12	7.90
Cleveland A7	7.90
Donora,Pa. A7	7.90
Duluth,Minn. A7	7.90
Fostoria,O. S1	7.95
Johnstown,Pa. B2	7.90
LosAngeles B3	8.85
Milbury,Mass.(12) N6	8.20
Minnequa,Colo. C10	8.15
Monessen,Pa. P7, P16	7.90
Muncie,Ind. I-7	8.10
Palmer,Mass. W12	8.20
Pittsburg,Calif. C11	8.85
Portsmouth,O. P12	7.90
Roebling,N.J. R5	8.20
S.Chicago,Ill. R2	7.90
S.SanFrancisco C10	8.85
SparrowsPt.,Md. B2	8.00
Struthers,O. Y1	7.90
Trenton,N.J. A7	8.20
Waukegan,Ill. A7	7.90
Worcester A7,J4,T6,W12	8.20

WIRE, Upholstery Spring

Aliquippa,Pa. J5	7.60
Alton,Ill. L1	7.775
Buffalo W12	7.60
Cleveland A7	7.60
Donora,Pa. A7	7.60
Duluth,Minn. A7	7.60
Johnstown,Pa. B2	7.60
KansasCity,Mo. S5	7.85
LosAngeles B3	8.55
Minnequa,Colo. C10	7.775
Monessen,Pa. P7, P16	7.60
NewHaven,Conn. A7	7.90
PalmerMass. W12	7.90
Pittsbuurg,Calif. C11	8.55
Portsmouth,O. P12	7.60
Roebling,N.J. R5	7.90
S.Chicago,Ill. R2	7.60
S.SanFrancisco C10	8.55
SparrowsPoint,Md. B2	7.70
Struthers,O. Y1	7.60
Trenton,N.J. A7	7.90
Waukegan,Ill. A7	7.60
Worcester,Mass. A7	7.90

WIRE, Fine & Weaving(8"Coils)

Alton,Ill. L1	12.725
Bartonville,Ill. K4	12.65
Buffalo W12	12.55
Chicago W13	12.55
Cleveland A7	12.55
Crawfordsville,Ind. M8	12.65
Fostoria,O. S1	12.55
Jacksonville,Fla. M8	12.90
Johnstown,Pa. B2	12.55
Kokomo,Ind. C16	12.55
Minnequa,Colo. C10	12.30
Monessen,Pa. P6	12.55
Muncie,Ind. I-7	12.75
Palmer,Mass. W12	12.85
Roebling,N.J. R5	12.85
S.SanFrancisco C10	12.90
Waukegan,Ill. A7	12.55
Worcester,Mass. A7,T6	12.85

WIRE, Gal'd ACSR for Cores

Bartonville,Ill. K4	10.70
Buffalo W12	10.70
Johnstown,Pa. B2	10.70
Minnequa,Colo. C10	10.825
Monessen,Pa. P16	10.70
Muncie,Ind. I-7	10.90
Palmer,Mass. W12	11.00
Pittsburg,Calif. C11	11.50
Portsmouth,O. P12	10.70
Roebling,N.J. R5	11.00
SparrowsPt.,Md. B2	10.80
Struthers,O. Y1	10.70

ROPE WIRE	(A)
Bartonville,Ill. K4	10.55
Buffalo W12	10.55
Fostoria,O. S1	10.55
Johnstown,Pa. B2	10.55
Monessen,Pa. P7, P16	10.55
Muncie,Ind. I-7	10.75
Palmer,Mass. W12	10.85
Portsmouth,O. P12	10.55
Roebling,N.J. R5	10.85
SparrowsPt. B2	10.65
Struthers,O. Y1	10.55
Worcester,Mass. J4	10.85

(A) Plow and Mild Plow; add 0.25c for Improved Plow.

WIRE
(Continued)

WIRE, Tire Bead

Bartonville,Ill. K4	14.15
Monessen,Pa. P16	14.20
Roebling,N.J. R5	14.35

WIRE, Cold-Rolled Flat

Anderson,Ind. G6	9.50
Baltimore T6	9.80
Boston T6	9.80
Buffalo W12	9.50
Cleveland A7	9.50
Crawfordsville,Ind. M8	9.50
Dover,O. G6	9.50
Fostoria,O. S1	9.50
FranklinPark,Ill. T6	9.60
Kokomo,Ind. C16	9.50
Massillon,O. R8	9.50
Milwaukee C23	9.70
Monessen,Pa. P7, P16	9.50
Pawtucket,R.I. N8	9.80
Riverdale,Ill. A1	9.60
Rome,N.Y. R6	9.50
Trenton,N.J. R5	9.80
Worcester A7, T6, W12	9.80

NAIL, Stock

To Dealers & Mfrs. (7)	Col.
AlabamaCity,Ala. R2	152
Aliquippa,Pa. J5	152
Atlanta A11	154
Bartonville,Ill. K4	154
Chicago,Ill. W13	152
Cleveland A9	157
Crawfordsville,Ind. M8	154
Donora,Pa. A7	152
Duluth,Minn. A7	152
Fairfield,Ala. T2	152
Galveston,Tex. D7	157
Houston,Tex. S5	157
Jack'ville,Fla(20) M8	163
Johnstown,Pa. B2	152
Joliet,Ill. A7	152
KansasCity,Mo. S5	157
Kokomo,Ind. C16	154
Minnequa,Colo. C10	157
Monessen,Pa. P7	152
Pittsburg,Calif. C11	171
Rankin,Pa. A7	152
S.Chicago,Ill. R2	152
SparrowsPt.,Md. B2	154
Sterling,Ill.(1) N15	152
Worcester,Mass. A7	158

NAILS, CUT (100 lb keg)

To Dealers (33)	
Conshohocken,Pa. A3	$9.05
Wheeling,W.Va. W10	9.05

STAPLES, Polished Stock

To Dealers & Mfrs. (7)	Col.
AlabamaCity,Ala. R2	152
Aliquippa,Pa. J5	152
Atlanta A11	154
Bartonville,Ill. K4	154
Crawfordsville,Ind. M8	154
Donora,Pa. A7	152
Duluth,Minn. A7	152
Fairfield,Ala. T2	152
Jack'ville,Fla(20) M8	163
Johnstown,Pa. B2	152
Joliet,Ill. A7	152
Kokomo,Ind. C16	154
Minnequa,Colo. C10	157
Monessen,Pa. P7	152
Pittsburg,Calif. C11	171
Rankin,Pa. A7	152
S.Chicago,Ill. R2	152
SparrowsPt.,Md. B2	154
Sterling,Ill. (1) N15	152
Worcester,Mass. A7	158

TIE WIRE, Automatic Baler (14½ Ga.)(Per 97 lb Net Box)

Coil No. 3150	
AlabamaCity,Ala. R2	$9.45
Bartonville,Ill. K4	9.45
Buffalo W12	9.45
Crawfordsville,Ind. M8	9.55
Donora,Pa. A7	9.45
Duluth,Minn. A7	9.45
Jacksonville,Fla. M8	10.01
Johnstown,Pa. B2	9.45
Joliet,Ill. A7	9.45
Kokomo,Ind. C16	9.55
LosAngeles B3	10.24
Minnequa,Colo. C10	9.60
Pittsburg,Calif. C11	10.23
S.Chicago,Ill. R2	9.45
SparrowsPt.,Md. B2	9.55
Sterling,Ill. N15	9.35

Coil No. 6500 Stand.	
AlabamaCity,Ala. R2	$9.75
Bartonville,Ill. K4	9.75
Buffalo W12	9.75
Crawfordsville,Ind. M8	9.85
Donora,Pa. A7	9.75
Duluth,Minn. A7	9.75
Jacksonville,Fla. M8	10.31
Johnstown,Pa. B3	9.75
Joliet,Ill. A7	9.75
Kokomo,Ind. C16	9.85
LosAngeles B3	10.55
Minnequa,Colo. C10	9.90
Pittsburg,Calif. C11	10.55
S.Chicago,Ill. R2	9.75
SparrowsPt.,Md. B2	9.85
Sterling,Ill. N15	9.65

Coil No. 6500 Interim	
AlabamaCity,Ala. R2	$9.80
Bartonville,Ill. K4	9.80
Buffalo W12	9.80
Crawfordsville,Ind. M8	9.90
Donora,Pa. A7	9.80
Duluth,Minn. A7	9.80
Jacksonville,Fla. M8	10.36
Johnstown,Pa. B2	9.80
Joliet,Ill. A7	9.80
Kokomo,Ind. C16	9.90
LosAngeles B3	10.60
Minnequa,Colo. C10	9.95
Pittsburg,Calif. C11	10.60
S.Chicago,Ill. R2	9.80
SparrowsPt.,Md. B2	9.90
Sterling,Ill. N15	9.70

WIRE, Barbed

	Col.
AlabamaCity,Ala. R2	175**
Aliquippa,Pa. J5	172§
Atlanta A11	181
Bartonville,Ill. K4	181
Crawfordsville,Ind. M8	181
Donora,Pa. A7	175†
Duluth,Minn. A7	175†
Fairfield,Ala. T2	175†
Houston,Tex. S5	180**
Jacksonville,Fla. M8	186
Johnstown,Pa. B2	179*
Joliet,Ill. A7	175†
KansasCity,Mo. S5	180**
Kokomo,Ind. C16	177†
Minnequa,Colo. C10	180**
Monessen,Pa. P7	178††
Pittsburg,Calif. C11	195†
Rankin,Pa. A7	175†
S.Chicago,Ill. R2	175**
S.SanFrancisco C10	195**
SparrowsPoint,Md. B2	181*
Sterling,Ill.(1) N15	179††

WOVEN FENCE, 9-15 ga.

	Col.
Ala.City,Ala. R2	162**
Ala.City, 17 ga. R2	257**
Aliq'ppa,Pa.9-14½ga J5	165§
Atlanta A11	168
Bartonville,Ill. K4	168
Crawfordsville,Ind. M8	168
Donora,Pa. A7	162†
Duluth,Minn. A7	162†
Fairfield,Ala. T2	162†
Houston,Tex. S5	167**
Jacksonville,Fla. M8	173
Johnstown,Pa. (43) B2	166
Joliet,Ill. A7	162†
KansasCity,Mo. S5	167**
Kokomo,Ind. C16	164†
Minnequa,Colo. C10	167**
Monessen,Pa. 9 ga. P7	166††
Pittsburg,Calif. C11	185†
Rankin,Pa. A7	162†
S.Chicago,Ill. R2	162**
Sterling,Ill.(1) N15	166††

	An'ld Galv.	Stone
WIRE (16 Gage)	**Stone**	**Galv.**
Ala.City R2	14.50	16.65**
Bartonville K4	14.50	16.55
Buffalo W12	14.50	
Cleveland A7	14.50	
Crawf'dsville M8	14.60	16.55
Fostoria,O. S1	14.60	16.15†
Jacksonville M8	14.95	16.50
Johnstown B2	14.50	16.40*
Kokomo C16	14.60	16.15†
Minnequa C10	14.75	16.45**
Palmer,MassW12	14.50	16.05*
Pitts.,Calif. C11	14.55	16.40†
S.Chicago R2	14.50	16.05**
SparrowsPt. B2	14.60	16.50*
Sterling(1) N15	14.50	16.45††
Waukegan A7	14.50	16.05
Worcester A7	14.80	

WIRE, Merchant Quality (6 to 8 gage)	An'ld Galv.
Ala.City,Ala. R2	7.50 7.90**
Aliquippa J5	7.40 7.925§
Atlanta A11	7.60 8.20
Bartonville(48) K4	7.60 8.20
Buffalo W12	7.50 7.90†
Cleveland A7	7.50
Crawfordsville M8	7.60 8.20
Donora,Pa. A7	7.50 7.90†
Duluth,Minn. A7	7.50 7.90†
Fairfield T2	7.50 7.90†
Houston(48) S5	7.65 8.05**
Jacks'ville,Fla. M8	7.85 8.45
Johnstown B2(48)	7.50 8.10*
Joliet,Ill. A7	7.50 7.90†
Kans.City(48) S5	7.65 8.05**
Kokomo C16	7.60 8.00†
LosAngeles B3	8.45 9.05*
Minnequa C10	7.65 8.05**
Monessen P7(48)	7.40 8.00††
Palmer,Mass. W12	7.80 8.20†
Pitts.,Calif. C11	8.45 8.85†
Portsmouth,O. P12	7.50
Rankin A7	7.50 7.90†
S.Chicago R2	7.50 7.90**
S.SanFran. C10	8.35 8.75**
Spar'wsPt. B2(48)	7.60 8.20*
Str'ling(1)(48)N15	7.40 8.00††
Struth'rs,O.(48) Y1	7.50 8.00†
Worcester,Mass.A7	7.80 8.20†

Based on zinc price of: *13.50c. †5c. §10c. ††Less than 10c. †††3c. **Subject to zinc equalization extras.

BALE TIES, Single Loop	Col.
AlabamaCity,Ala. R2	175
Atlanta A11	175
Bartonville,Ill. K4	177
Crawfordsville,Ind. M8	177
Donora,Pa. A7	175
Duluth,Minn. A7	175
Fairfield,Ala. T2	175
Jacksonville,Fla. M8	182
Joliet,Ill. A7	175
Houston S5	178
KansasCity,Mo. S5	178
Kokomo,Ind. C16	177
Minnequa,Colo. C10	178
Pitts.,Calif. C11	199
S.Chicago R2	175
S.SanFran.,Calif. C10	197
SparrowsPoint,Md. B2	177
Sterling,Ill.(1) N15	173

FENCE POSTS	Col.
ChicagoHts.,Ill. C2, I-2	157
Duluth,Minn. A7	157
Franklin,Pa. F5	157
Huntington,W.Va. W7	157
Johnstown,Pa. B2	157
Marion,O. P11	157
Minnequa,Colo. C10	162
Moline,Ill. R2	162
S.Chicago,Ill. R2	157
Tonawanda,N.Y. B12	157
Williamsport,Pa. S10	160

FASTENERS

(Base discounts, full case quantity, per cent off list to consumer, f.o.b. mill)

Carriage, Machine Bolts

Full-Size Body (cut thread)

†½" x 6" and smaller	61
Larger than ½" diam. and all diams. longer than 6"	55

Under-Size Body (rolled thread; not nutted):

½" x 6" and smaller	61

†½" x 4" and smaller and shorter are not nutted.

Carriage, Machine & Lag Bolts, Hot Galvanized:

½" and smaller	42
Larger than ½" diam. and all diams. longer than 6"	32

Lag Bolts

All diams. & 6" and shorter	61
All diams. longer than 6"	55

Plow, Tap & Blank Bolts

½" x 6" and smaller	61
Larger than ½" diam. and all diams. longer than 6"	55

Ribbed Neck, Carriage, Step, Elevator, Fitting-up and Tire Bolts:

All sizes	61

STOVE BOLTS, SLOTTED (nuts not attached; bulk)

⅛" to ¼" diam. incl., 3" or shorter:	
25,000 to 199,999 pieces	61
200,000 or more pieces	64
⅝" to ½" diam., incl., 3" or shorter:	
15,000 to 99,999 pieces	61
100,000 or more pieces	64
Longer than 3", any diam.:	
5000 to 99,999 pieces	61
100,000 or more pieces	64

RIVETS

F.o.b. Cleveland and/or freight equalized with Pittsburgh, f.o.b. Chicago, and/or freight equalized with Birmingham except where equalization is too great.

Structural ½-in., larger 9.95
⅞-in. under..List less 32%

BOILER TUBES

Net base c.l. prices, dollars per 100 ft, mill; minimum wall thickness, cut lengths 10 to 24 ft, inclusive.

O.D.	B.W.	Seamless		Elec. Weld
In.	Gage	H.R.	C.D.	H.R.
1	13	....	21.55	20.90
1¼	13	..	25.53	21.25
1½	13	34.24	28.22	23.50
1⅝	13	28.63	33.34	27.76
2	13	32.09	37.37	31.13
2¼	13	36.14	42.09	35.05
2½	12	39.23	45.67	38.05
2⅝	12	43.22	50.31	41.91
2¾	12	46.79	54.48	45.38
3	12	49.90	58.10	48.39

RAILWAY MATERIALS

	Standard			Toe Rails
			All	60 lb
RAILS	No. 1	No. 2	No. 2	Under
Bessemer,Pa. U5	4.725	4.625	4.675	5.65
Ensley,Ala. T2	4.725	4.625	....	5.65
Fairfield,Ala. T2	....	....	....	5.65
Gary,Ind. U5	4.725	4.625	4.675	....
Huntington,W.Va. W7	....	....	....	5.65
IndianaHarbor,Ind. I-2	4.725	4.625	4.675	....
Johnstown,Pa. B2	....	....	...(16)	5.65
Lackawanna,N.Y. B2	4.725	4.625	...(16)	5.65
Minnequa,Colo. C10	4.725	4.625	....	6.15
Steelton,Pa. B2	4.725	4.625	....	....
Williamsport,Pa. S10	....	....	....	5.65

TIE PLATES

Fairfield,Ala. T2	5.625
Gary,Ind. U5	5.625
Ind.Harbor,Ind. I-2	5.625
Lackawanna,N.Y. B2	5.625
Minnequa,Colo. C10	5.625
Seattle B3	5.775
Steelton,Pa. B2	5.625
Torrance,Calif. C11	5.775

TRACK BOLTS, Untreated

Cleveland R2	12.15
KansasCity,Mo. S5	12.90*
Lebanon,Pa. B2	12.15
Minnequa,Colo. C10	12.15
Pittsburgh O3, P14	12.15
Seattle B3	12.65

*Treated

AXLES

Ind.Harbor,Ind. S13	7.50
Johnstown,Pa. B2	7.50

JOINT BARS

Bessemer,Pa. U5	5.825
Fairfield,Ala. T2	5.825
Ind.Harbor,Ind. I-2	5.825
Joliet,Ill. U5	5.825
Lackawanna,N.Y. B2	5.825
Minnequa,Colo. C10	5.825
Steelton,Pa. B2	5.825

SCREW SPIKES

Cleveland R2	11.90
Pittsburgh O3	11.90

STANDARD TRACK SPIKES

Fairfield,Ala. T2	8.05
Ind.Harbor,Ind. Y1	8.05
Ind.Harbor,Ind. I-2	7.90
KansasCity,Mo. S5	7.90
Lebanon,Pa. B2	8.05
Minnequa,Colo. C10	7.90
Pittsburgh J5	8.05
Seattle B3	8.55
S.Chicago,Ill. R2	8.05
Struthers,O. Y1	8.05
Youngstown R2	8.05

METAL POWDER

(Per pound f.o.b. shipping point in ton lots for minus 100 mesh, except as noted)

	Cents
Sponge iron:	
98+% Fe, annealed	9.25
Swedish, c.l.f., Camden, N. J., c.l. in bags	9.50
Domestic:	
F.o.b., Johnstown, Pa., Niagara Falls, N. Y., in bags	9.50
F.o.b. Riverton, N. J., in bags	8.50
Canadian, f.o.b. shipping point	9.50
Electrolytic iron:	
Melting stock, 99.9% Fe, irregular fragments of ⅛ in. x 1.3 in.	22.00
Annealed, 99.5% Fe	36.50
Unannealed (99+% Fe)	34.00
Unannealed (99+% Fe) (minus 325 mesh)	57.00
Powder Flakes (minus 16, plus 100 mesh)	31.00
Carbonyl Iron:	
98.1-99.9%, 3 to 20 microns, depending on grade, 86.00-275.00, in standard 200-lb containers; all minus 200 mesh.	
Aluminum:	
Atomized, 500 lb, drum frght. allowed	
Carlots	34.50
Ton lots	36.50
Antimony, 500 lb lots	32.00*
Brass, 5000-lb lots	41.75-65.25†
Bronze, 5000-lb lots	67.50-71.75†
Copper:	
Electrolytic	14.25*
Reduced	14.25*
Lead	7.50*
Manganese:	
Minus 35 mesh	64.00
Minus 100 mesh	70.00
Minus 200 mesh	75.00
Nickel, unannealed	$1.00
Nickel-Silver, 5000-lb lots	62.75-65.25†
Phosphor-Copper, 5000-lb lots	68.75
Silicon	47.50
Solder	7.00*
Stainless Steel, 302	99.00
Stainless Steel, 316	$1.32
Tin	14.50*
Zinc 5000-lb lots	19.25-33.00†
Tungsten	Dollars
Melting grade, 99% 60 to 200 mesh:	
1000 lb and over	4.50
Less than 1000 lb	4.65
Chromium, electrolytic 99.8% Cr min. metallic basis	5.00

*Plus cost of metal. †Depending on composition. ‡Depending on mesh. §70% Cu, 20% Zn, 10% Ni. **64% Cu, 18% Zn, 18% Ni.

Footnotes

(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Reinforcing.
(5) 1¼ in. to less than 1 7/16-in.
(6) Chicago or Birm. base.
(7) To jobbers, 3 cols. lower.
(8) 16 Ga. and heavier.
(9) Merchant quality; add 0.35c for special quality.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass., base.
(13) Add 0.25c for 17 Ga. & heavier.
(14) Gage 0.143 to 0.249 in.; for gage 0.142 and lighter, 5.80c.
(15) ⅝" and thinner.
(16) 40 lb and under.
(17) Flats only; 0.25 in. & heavier.
(18) To dealers.
(19) Chicago & Pitts. base.
(20) Plus 1c per 100 lb.
(21) New Haven, Conn., base.
(22) Deld. San Francisco Bay area.
(24) Deduct 0.10c, finer than 15 Ga.
(25) Bar mill bands.
(26) Delivered in mill zone, 5.25c.
(27) Bar mill sizes.
(28) Bonderized.
(29) Youngstown base.
(30) Sheared; for universal mill add 0.45c.
(31) Widths over ⅝ in.; 6.90c for widths ⅝ in. and under by 0.125 in. and thinner.
(32) Buffalo base.
(33) To jobbers, deduct 20c.
(34) 9.80c for cut lengths.
(35) 12" and narrower.
(36) 54" and narrower.
(37) 13 Ga. & heavier; 60" & narrower.
(38) 14 Ga. & Lighter; 48" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.035" and heavier, 0.25c higher.
(41) 9.15c for cut lengths.
(42) Mill lengths, f.o.b. mill; deld. in mill zone or within switching limits, 5.25c.
(43) 9-14½ Ga.
(48) 6-7 Ga.
(49) 1⅛ in. and smaller rounds; 7.95c over 3⅛ in. and other shapes.

SEAMLESS STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	2		2½		3		3½		4		5		6	
List Per Ft	37c		58.5c		76.5c		92c		$1.09		$1.48		$1.92	
Pounds Per Ft	3.68		5.82		7.62		9.20		10.89		14.81		19.18	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	4	+14	10.5	+8.25	13	+5.75	14.5	+4.25	14.5	+4.25	14	+4.75	16.5	+2.25
Ambridge, Pa. N2	4	...	10.5	....	13	....	14.5	....	14.5	....	14	....	16.5	....
Lorain, O. N3	4	+14	10.5	+8.25	13	+5.75	14.5	+4.25	14.5	+4.25	14	+4.75	16.5	+2.25
Youngstown Y1	6.5	+11.5	10.5	+8.25	13	+5.75	14.5	+4.25	14.5	+4.25	14	+4.75	16.5	+2.25

ELECTRIC WELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Youngstown R2	6.5	+11.5	10.5	+8.25	13	+5.75	14.5	+4.25	14.5	+4.25	14	+4.75	16.5	+2.25

BUTTWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	⅛		¼		⅜		½		¾		1		1¼	
List Per Ft	5.5c		6c		6c		8.5c		11.5c		17c		23c	
Pounds Per Ft	0.24		0.42		0.57		0.85		1.13		1.68		2.28	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	....	....	....	....	....	....	18.5	+0.75	21.5	3.25	24	6.75	26.5	8.5
Alton, Ill. L1	....	....	....	....	....	....	16.5	+2.75	19.5	1.25	22	4.75	24.5	6.5
Benwood, W. Va. W10	17.5	+13	9	+18.5	+0.75	+28.5	18.5	+0.75	21.5	3.25	24	6.75	26.5	8.5
Butler, Pa. F6	18	+12.5	9.5	+18	1.5	+26	....	....	....	....	....	....	....	....
Etna, Pa. N2	....	....	....	....	....	....	18.5	+0.75	21.5	3.25	24	6.75	26.5	8.5
Fairless, Pa. N3	....	....	....	....	....	....	16.5	+2.75	19.5	1.25	22	4.75	24.5	6.5
Fontana, Calif. K1	....	....	....	....	....	....	6	+13.25	9	+9.25	11.5	+5.75	14	+4
Ind. Harbor, Ind. Y1	....	....	....	....	....	....	17.5	+1.75	20.5	2.25	23	5.75	25.5	7.5
Lorain, O. N3	....	....	....	....	....	....	18.5	+0.75	21.5	3.25	24	6.75	26.5	8.5
Sharon, Pa. S4	18	+12.5	9.5	+18	1.5	+26	....	....	....	....	....	....	....	....
Sharon, Pa. M6	....	....	....	....	....	....	18.5	+0.75	21.5	3.25	24	6.75	26.5	8.5
Sparrows Pt., Md. B2	16	+12.5	7.5	+18	+0.5	+25	16.5	+0.75	19.5	3.25	22	6.75	24.5	8
Youngstown R2, Y1	....	....	....	....	....	....	18.5	+0.75	21.5	3.25	24	6.75	26.5	8.5
Wheatland, Pa. W9	18	+12.5	9.5	+18	1.5	+26	18.5	+0.75	21.5	3.25	24	6.75	26.5	8.5

Size—Inches	1½		2		2½		3		3½		4	
List Per Ft	27.5c		37c		58.5c		76.5c		92c		$1.09	
Pounds Per Ft	2.73		3.68		5.82		7.62		9.20		10.89	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	27	9.5	27.5	10	29	10.75	29	10.75	....	....	....	....
Alton, Ill. L1	25	7.5	25.5	8	27	8.75	27	8.75	....	....	....	....
Benwood, W. Va. W10	27	9.5	27.5	10	29	10.75	29	10.75	19.5	0.75	19.5	0.75
Etna, Pa. N2	27	9.5	27.5	10	29	10.75	29	10.75	19.5	0.75	19.5	0.75
Fairless, Pa. N3	25	7.5	25.5	8	27	8.75	27	8.75	17.5	+1.25	17.5	+1.25
Fontana, Calif. K1	14.5	+3	15	+2.5	16.5	+1.75	16.5	+1.75	7	+11.75	7	+11.75
Ind. Harbor, Ind. Y1	26	8.5	26.5	9	28	9.75	28	9.75	18.5	+0.25	18.5	+0.25
Lorain, O. N3	27	9.5	27.5	10	29	10.75	29	10.75	....	....	....	....
Sharon, Pa. M6	27	9.5	27.5	10	29	10.75	29	10.75	....	....	....	....
Sparrows Pt., Md. B2	25	9	25.5	9.5	27	9.75	27	9.75	17.5	+0.25	17.5	+0.25
Wheatland, Pa. W9	27	9.5	27.5	10	29	10.75	29	10.75	19.5	0.75	19.5	0.75
Youngstown R2, Y1	27	9.5	27.5	10	29	10.75	29	10.75	19.5	0.75	19.5	0.75

*Galvanized pipe discounts based on current price of zinc (13.50c, East St. Louis).

Stainless Steel

Representative prices, cents per pound, subject to current lists of extras

AISI Type	Rerolling Ingot	Rerolling Slabs	Forging Billets	Seamless Tube Billets	H.R. Strip	Wire Rods; C.F. Wire	Bars; Structural Shapes	Plates	Sheets	C.R. Strip; Flat Wire
201	18.50	23.00	....	....	31.00	....	....	....	42.25	39.00
202	19.75	25.50	31.00	36.25	33.50	....	36.75	38.75	42.50	42.50
301	19.25	23.75	....	36.75	32.00	36.00	38.00	....	44.25	41.00
302	20.50	26.25	32.00	37.25	34.50	36.25	38.25	40.25	44.50	44.50
302B	20.25	26.50	33.00	37.25	37.75	36.25	38.25	40.25	47.00	47.00
303	....	26.75	34.75	40.00	....	39.00	41.00	....	....	....
304	21.75	27.50	33.75	39.00	37.25	38.25	40.25	43.00	47.25	47.25
304L	....	....	40.25	....	43.75	45.25	47.25	50.00	54.25	54.25
305	23.25	30.50	....	39.50	40.25	38.25	40.25	43.50	50.25	50.25
308	25.00	32.00	40.00	....	42.75	45.25	47.50	51.75	54.00	54.00
309	32.50	41.25	48.25	....	55.00	54.00	56.75	60.25	69.00	69.00
310	39.75	50.50	64.75	....	71.00	72.25	76.50	78.25	81.75	81.75
314	....	....	....	....	....	72.75	....	78.25	....	....
316	33.00	41.75	52.75	....	58.75	59.75	62.75	66.00	70.25	70.25
316L	....	....	58.75	....	65.75	66.75	69.75	73.00	77.25	77.25
317	40.25	51.25	65.75	....	76.50	74.75	78.50	81.00	87.75	87.75
321	26.50	33.50	39.75	....	45.75	45.00	47.25	51.25	56.25	56.25
18-8CbTa	30.75	39.50	47.25	....	54.75	52.75	55.50	60.00	68.50	68.50
403	....	....	28.75	32.75	....	32.25	34.00	36.25	....	....
405	17.50	23.00	26.75	31.00	32.25	30.50	32.00	33.75	42.25	42.25
410	15.00	19.50	25.50	29.50	28.00	29.00	30.50	31.75	36.25	36.25
414	....	....	26.00	30.00	....	29.50	31.00	....	....	....
420	....	30.25	31.00	36.00	37.75	35.50	37.25	40.75	56.00	56.00
430	15.25	19.75	26.00	30.00	28.75	29.50	31.00	32.25	36.75	36.75
430F	....	....	26.50	30.50	....	30.00	31.50	....	....	....
431	....	25.50	33.25	....	....	37.25	39.25	40.75	....	....
446	....	....	35.50	40.50	53.25	40.00	42.00	43.25	63.25	63.25

Stainless Steel Producers Are: Allegheny Ludlum Steel Corp.; Alloy Metal Wire Co. Inc.; Alloy Tube Div., Carpenter Steel Co.; American Steel & Wire Div., U. S. Steel Corp.; Armco Steel Corp.; Babcock & Wilcox Co.; Bethlehem Steel Co.; J. Bishop & Co.; G. O. Carlson Inc.; Carpenter Steel Co.; Charter Wire Products Co.; Cold Metal Products Co.; Crucible Steel Co. of America; Damascus Tube Co.; Wilbur B. Driver Co.; Driver-Harris Co., Eastern Stainless Steel Corp.; Ellwood Ivins Steel Tube Works Inc.; Firth Sterling Inc.; Ft. Wayne Metals Inc.; Globe Steel Tubes Co.; Helical Tube Co.; Indiana Steel & Wire Co.; Ingersoll Steel Div., Borg-Warner Corp.; Jessop Steel Co.; Johnson Steel & Wire Co. Inc.; Joslyn Mfg. & Supply Co.; Kenmore Metals Corp.; Maryland Fine & Specialty Wire Co.; McLouth Steel Corp.; Metal Forming Corp.; McInnes Steel Co.; National-Standard Co.; National Tube Div., U. S. Steel Corp.; Newman-Crosby Steel Co.; Pacific Tube Co.; Page Steel & Tube Div., American Chain & Cable Co. Inc.; Pittsburgh Rolling Mills Inc.; Republic Steel Corp.; Rodney Metals Inc.; Rome Mfg. Co.; Rotary Electric Steel Co.; Sharon Steel Corp.; Sawhill Tubular Products Inc.; Simonds Saw & Steel Co.; Specialty Wire Co. Inc.; Spencer Wire Corp.; Stainless Welded Products Inc.; Standard Tube Co.; Superior Steel Corp., Superior Tube Co.; Timken Roller Bearing Co.; Trent Tube Co.; Tube Methods Inc.; Ulbrich Stainless Steels; United States Steel Corp.; Universal-Cyclops Steel Co.; Wallingford Steel Co.; Washington Steel Corp.

Clad Steel

	Plates, Carbon Base, 10%	Plates, Carbon Base, 20%	Sheets, Carbon Base, 20%
302	....	....	39.50
304	30.30	36.05	32.50
304-L	32.30	37.95	....
310	41.30	47.00	....
316	35.50	41.40	47.00
316-L	40.00	46.10	....
316-CB	41.15	48.45	....
321	32.00	37.75	37.25
317	34.40	41.40	48.25
405	25.80	33.35	....
410	25.30	32.85	....
430	25.30	32.85	....
Inconel	49.45	65.45	....
Nickel	41.05	55.65	....
Nickel, Low Carbon	43.25	60.05	....
Monel	42.35	56.35	....
Copper*	....	....	46.00

	Strip, Carbon Base, Cold Rolled, 10%	Strip, Carbon Base, Cold Rolled, Both Sides
Copper*	33.75	42.75

*Deoxidized. Production points: Stainless-clad sheets, New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7, New Castle, Ind. I-4 and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; copper-clad strip, Carnegie, Pa. S18.

Tool Steel

Grade	$ per lb	Grade	$ per lb
Regular Carbon	0.275	5% Cr Hot Work	0.430-0.460
Extra Carbon	0.330	W-Cr Hot Work	0.450
Special Carbon	0.390	V-Cr Hot Work	0.470
Oil Hardening	0.430	Hi-Carbon-Cr	0.770

Grade by Analysis (%)

W	Cr	V	Co	Mo	$ per lb
20.25	4.25	1.6	12.25	....	4.090
18.25	4.25	1	4.75	....	2.305-2.475
18	4	2	9	....	2.675-2.6775
18	4	2	....	....	1.765
18	4	1	....	....	1.600
13.75	3.75	2	5	....	2.245
13.5	4	3	....	....	1.865
9	3.5	....	....	....	1.180
6	4	2	....	5	1.105
6	4	3	....	6	1.350
1.5	4	1	....	8.5	0.960

Tool steel producers include: A4, A8, B2, B8, C4, C9, C13, C18, D4, F2, J3, M14, S8, U4, V2 and V3.

Pig Iron

F.o.b. furnace prices in dollars per gross ton, as reported to STEEL. Minimum delivered prices are approximate and do not include 3% federal tax.

Birmingham District	Basic	No. 2 Foundry	Malleable	Bessemer
AlabamaCity,Ala., R2	54.50	....	....	....
Birmingham R2	54.50	55.001	....	....
Birmingham U8	....	55.001	59.00	....
Woodward,Ala., W15	54.50	55.001	59.00	....
Cincinnati, deld.	....	62.70	....	....
Buffalo District				
Buffalo H1, R2	60.00	60.50	61.00	61.50
Tonawanda,N.Y., W12	60.00	60.50	61.00	61.50
N.Tonawanda,N.Y., T9	....	60.50	61.00	61.50
Boston, deld.	70.65	71.15	71.65	....
Rochester,N.Y., deld.	63.02	63.52	64.02	....
Syracuse,N.Y., deld.	64.12	64.62	65.12	....
Chicago District				
Chicago I-3	60.00	60.50	60.50	61.00
Gary,Ind. U5	60.00	....	60.50	....
S.Chicago R2	60.00	....	60.50	....
S.Chicago,Ill. Y1	60.00	60.50	60.50	61.00
S. Chicago,Ill. U5, W14	60.00	....	60.50	61.00
Milwaukee, deld.	62.30	62.80	62.80	63.30
Muskegon,Mich., deld.	....	67.18	67.18	....
Cleveland District				
Cleveland R2, A7	60.00	60.50	60.50	61.00
Akron,O., deld.	62.75	63.25	63.25	63.75
Mid-Atlantic District				
Bethlehem,Pa., B2	62.00	62.50	63.00	63.50
NewYork, deld.	....	66.51	67.01	....
Newark, deld.	65.26	65.76	66.26	66.76
Birdsboro,Pa., B10	62.00	62.50	63.00	63.50
Chester,Pa., P14	62.00	62.50	63.00	....
Philadelphia, deld.	63.76	64.26	64.76	....
Steelton,Pa., B2	62.00	62.50	63.00	63.50
Swedeland,Pa., A3	62.00	62.50	63.00	63.50
Philadelphia, deld.	63.76	64.26	64.76	65.26
Troy,N.Y., R2	62.00	62.50	63.00	63.50
Pittsburgh District				
NevilleIsland,Pa., P6	60.00	60.50	60.50	61.00
Pittsburgh (N&S sides), Aliquippa, deld.	....	61.95	61.95	62.45
McKeesRocks, deld.	....	61.60	61.60	62.13
Lawrenceville, Homestead, Wilmerding,Monaca, deld.	....	62.26	62.26	62.79
Verona,Trafford, deld.	62.29	62.82	62.82	63.35
Brackenridge, deld.	62.60	63.10	63.10	63.63
Bessemer,Pa., U5	60.00	....	60.50	61.00
Clairton,Rankin,S.Duquesne,Pa., U5	60.00	....	....	....
Midland,Pa., C18	60.00	....	....	....

Youngstown District	Basic	No. 2 Foundry	Malleable	Bessemer
Hubbard,O., Y1	....	....	60.50	....
Sharpsville,Pa., S6	60.00	....	60.50	61.00
Youngstown Y1	....	....	60.50	61.00
Mansfield,O., deld.	64.90	....	65.40	65.90
Duluth I-3	60.00	60.50	60.50	61.00
Erie,Pa., I-3	60.00	60.50	60.50	61.00
Everett,Mass., E1	62.00	62.50	63.00	....
Fontana,Calif., K1	67.50	68.00	....	....
Geneva,Utah C11	60.00	60.50	....	....
GraniteCity,Ill., G4	61.90	62.40	62.90	....
Ironton,Utah C11	60.00	60.50	....	....
LoneStar,Texas L6	....	55.00*	....	....
Minnequa,Colo., C10	62.00	62.50	63.00	....
Rockwood,Tenn., T3	....	53.001	59.00	....
Toledo,O., I-3	60.00	60.50	60.50	61.00
Cincinnati, deld.	65.76	66.26	....	....

*Phos. 0.51-0.75%; $56. Phos. 0.31-0.50%.
‡Intermediate (Phos. 0.31-0.69%), $56.

PIG IRON DIFFERENTIALS

Silicon: Add 50 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos iron on which base is 1.75-2.00%.
Manganese: Add 50 cents per ton for each 0.50% manganese over 1% or portion thereof.
Nickel: Under 0.05% no extra; 0.50-0.74%, inclusive, add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.00-6.50% silicon; add $1.25 for each 0.5% Si; 75 cents for each 0.50% Mn over 1%)

Jackson,O., G2, J1	69.00
Buffalo H1	70.25

ELECTRIC FURNACE SILVERY IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1 for each 0.50% Mn over 1%; $2 per gross ton premium for 0.045% max P)

NiagaraFalls,N.Y., P15	$92.50
Keokuk,Iowa, Open-hearth & Fdry. (freight allowed K2)	97.00
Keokuk, O. H. & Fdry., 12½ lb piglets, 16% Si, frgt allowed K2	100.00

LOW PHOSPHORUS PIG IRON, Gross Ton

Lyles,Tenn., T3 (Phos. 0.035% max)	$72.50
Rockwood,Tenn., T3 (Phos. 0.035% max)	72.50
Steelton,Pa., B2 (Phos. 0.035% max)	68.00
Philadelphia, deld.	71.55
Troy,N.Y., R2 (Phos. 0.035% max)	68.00
Cleveland A7 (Intermediate) (Phos. 0.036-0.075% max)	65.00
Duluth I-3 (Intermediate) (Phos. 0.036-0.075% max)	65.00
Erie,Pa., I-3 (Intermediate) (Phos. 0.036-0.075% max)	65.00
NevilleIsland,Pa., P6 (Intermediate) (Phos. 0.036-0.075% max)	65.00

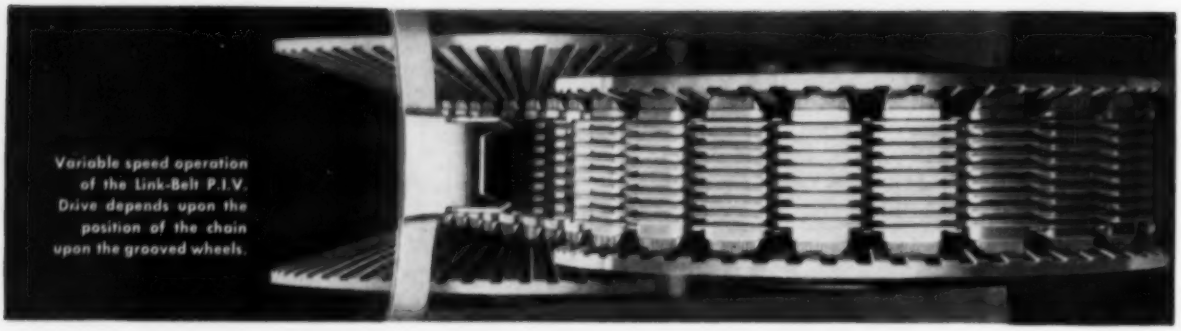
Warehouse Steel Products

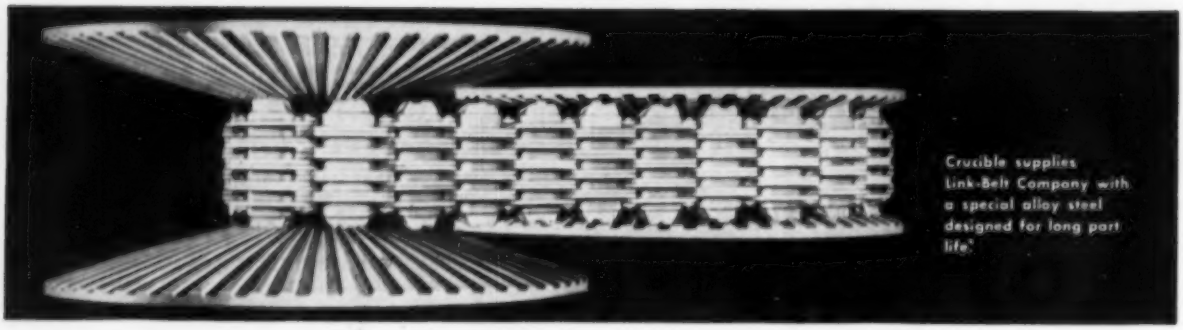
Representative prices, per pound, subject to extras, f.o.b. warehouse. City delivery charges are 15 cents per 100 lb except: St. Paul, 25 cents; Moline, Norfolk, Richmond, Washington, 20 cents; Baltimore, Boston, Los Angeles, New York, Philadelphia, Portland, San Francisco, 10 cents; Atlanta, Houston, Seattle, Spokane, no charge.

	SHEETS				STRIP	BARS				Standard Structural Shapes	PLATES	
	Hot-Rolled	Cold-Rolled	Gal. 10 Ga.†	Stainless Type 302	Hot-Rolled*	H.R. Merchant Qual.	H.R. Spec. Qual.	C.F. Rds.‡	H.R. Alloy 4140††		Carbon	Floor
Atlanta	7.14	8.20	8.87	....	7.40	7.42	....	9.39	....	7.63	7.49	9.48
Baltimore	7.24	8.35	9.50	....	7.70	7.70	....	8.49§	14.39	7.94	7.56	9.02
Birmingham	7.13	8.24	8.85	....	7.21	7.27	7.80	9.35	....	7.43	7.45	9.50
Boston	8.12	9.07	10.32	53.32	8.21	8.21	8.76	9.86	13.66	8.27	8.41	9.84
Buffalo	7.20	8.25	10.01	....	7.35	7.35	8.05	7.90	13.50	7.60	7.65	9.00
Chattanooga	7.28	8.44	8.60	....	7.36	7.42	7.95	9.18	....	7.63	7.60	9.32
Chicago	7.13	8.24	9.10	46.75	7.21	7.27	7.80	7.75	13.15	7.43	7.45	8.72
Cincinnati	7.25	8.23	9.10	46.10	7.45	7.51	8.04	8.15	13.40	7.90	7.74	8.97
Cleveland	7.13	8.24	8.95	49.16	7.31	7.33	7.86	8.00	13.24	7.76	7.62	8.89
Denver	8.95	10.31	11.73	....	9.10	9.10	....	9.82	17.87	8.95	9.10	10.50
Detroit	7.32	8.43	9.38	43.50	7.49	7.55	8.08	8.04	13.39	7.90	7.73	8.91
Erie, Pa.	7.08	8.24	8.95¶	....	7.31	7.35	....	8.10¶	....	7.65	7.30	8.79
Houston	7.85	8.75	10.49	....	8.15	8.25	....	9.85	14.00	8.20	7.80	9.20
Jackson, Miss.	7.46	8.52	9.22	....	7.44	7.59	8.12	9.14	....	7.75	7.77	9.44
Los Angeles	8.15	10.00	11.00	51.50	8.50	8.15	8.70	10.90	14.49	8.30	8.75	10.85
Milwaukee	7.22	8.33	9.19	....	7.30	7.36	7.80	7.94	13.24	7.60	7.54	8.81
Moline, Ill.	7.15	8.44	8.85	....	7.41	7.43	....	8.00	....	7.63	7.34	....
New York	7.78	8.88	9.63	53.13	8.23	8.16	8.71	9.77	13.57	8.11	8.21	9.50
Norfolk, Va.	7.35	....	....	....	7.80	7.85	....	9.95	....	8.10	7.60	9.10
Philadelphia	7.34	8.44	9.41	45.98	7.99	7.73	8.26	8.52	13.35	7.75	7.72	8.43**
Pittsburgh	7.13	8.24	9.40	49.00	7.21	7.27	7.80	8.00	13.15	7.43	7.45	8.72
Portland, Oreg.	7.80	8.80	10.65	....	8.00	7.95	....	12.20	15.00	7.85	7.75	9.60
Richmond, Va.	7.25	....	9.49	....	7.85	7.85	....	9.50	....	8.10	7.50	9.35
St. Louis	7.42	8.53	9.69	43.89	7.50	7.56	8.09	8.29	13.44	7.83	7.74	9.01
St. Paul	7.46	8.59	9.16	....	7.72	7.74	....	8.51	13.51	7.84	7.65	9.12
San Francisco	8.20	9.65	10.15	51.65	8.35	8.15	8.70	11.45	14.40¶	8.25	8.30	10.50
Seattle	7.85	10.50	10.90	54.00	8.90	8.60	9.15	12.25	14.75	8.50	8.50	10.70
Spokane, Wash.	8.90	11.25	11.05	....	9.05	8.75	9.30	12.40	15.65	8.65	8.65	11.35
Washington	7.78	9.80	8.60	....	8.49	8.24	....	9.49	....	8.51	8.11	9.56

*Prices do not include gage extras; †prices include gage and coating extras (based on 13.50-cent zinc), except in Birmingham (coating extra excluded); ‡includes 35-cent special bar quality extras; **¼-in. and heavier; ††as annealed; §§under ½-in.

Base quantities, 2000 to 4999 lb except as noted; Cold-rolled strip and cold-finished bars 2000 lb and over except in Seattle, 2000 to 9999 lb, and in Los Angeles, 4000 lb and over; stainless sheets, 6000 lb except in Chicago, New York and Boston, 10,000 lb, and in San Francisco, 2000 to 4999 lb; hot-rolled products on West Coast, 2000 to 9999 lb; ¶—500 to 9999 lb; #—100 to 999 lb; ^—4000 lb and over; ‖—1000 to 1999 lb; ^^—1000 lb and over; †—1500 to 3999 lb; §—2000 to 2999 lb; ¶—f.o.b. local delivery in lots of 10,000 lb and over; **—2000 lb and over.





these

SPECIAL ALLOY STEEL PARTS

keep Link-Belt's P.I.V. Drive on the job

Keeping production operations going at the right speed is the job of this variable speed drive unit produced by Link-Belt Company. Its operation is based on an exclusive drive chain with self-forming metal teeth, which engage with radial grooves in two pairs of cone-shaped wheels.

To make these precision wheels requires a steel that can be readily machined, will not distort, and which has high-strength. That's why Crucible furnishes Link-Belt with a special Nitriding BM alloy steel *designed* for this application. After machining the wheels are Nitrided to obtain a minimum surface hardness of 1000 Vickers Diamond Brinnel – about the hardest surface that can be obtained commercially.

When your application requires a tough, machinable, nondeforming alloy steel – call Crucible. One of our many special alloy grades may be the right one for you – or we can develop one to meet your most exacting demands. *Crucible Steel Company of America, The Oliver Building, Mellon Square, Pittsburgh 22, Pa.*

CRUCIBLE first name in special purpose steels

Crucible Steel Company of America

Wiremakers See New Market

Aluminum coated wire expected to challenge tonnage of galvanized. Producers are looking to core wire of ACSR cable for biggest potential use

IF you have a wire problem involving corrosion resistance, special high-shine finish or good heat reflectivity, it may pay you to check aluminum-coated wire.

The new wire has been on the market on a tonnage basis for only a year or two, so it is still in the developmental stage. But some idea of the large potential market already is evident to the producers. At present it is a specialty wire, but the three producers see a market similar to that for galvanized wire. In fact, they readily admit that it will compete directly with galvanized, which all three produce, but they claim it will never replace it. Producers are: American Steel & Wire Division of U. S. Steel Corp.; Page Steel & Wire Division of American Chain & Cable Co. Inc.; and Sheffield Steel Division of Armco Steel Corp.

Growth Pattern—Page, which has been producing aluminized wire the longest, says that tonnage this year has doubled that of last year. While the rate of growth may not be as spectacular from year to year in the future, tonnage is expected to continue a steep upward climb as the product catches on with consumers. AS&W, too, feels that customer acceptance will be rapid.

While there are technological differences in the methods used by the producers, the end result is pretty much the same—a coated wire which one producer says will outlast galvanized, thickness for thickness. It is more expensive than galvanized, so it is being sold on the basis of quality, long life and finish.

Markets—The biggest potential market is use in the core wire for ACSR cable. At present there are technical difficulties, but they are being ironed out. There are no ASTM specifications for any of the aluminized wire, but a task force committee is presently working out specs for ACSR applications. A report from this committee is expected within the next year.

Page is putting the largest portion of its output into chain link fence. Others are experimenting with the material for ordinary wire fencing for farm use and applications around corrosive atmospheres, such as near steel mills.

Problems—Charles Meyers, product manager for AS&W, says the wire is not up to full coating standards in all respects. The high temperature of the aluminum bath—about 1300°F—gives practically an annealing condition. The wire must be absolutely clean or black specks will develop on the finish. But these problems are being worked out, and eventually where high-shine finish is the prime requirement, aluminum coated wire will be an answer.

Sheets, Strip . . .

Sheet & Strip Prices, Pages 169 & 170

There is a disposition among sheet consumers to mark time, pending development in the steel wage negotiations. Most consumers have been able to build up inventories, and it is too late for any hedge buying in anticipation of higher prices and a possible steel strike. Further, most buyers have specified fairly well for July, partly on the theory that if there is a walkout at the mills, these July specifications would likely be among the first to receive attention once operations are resumed.

Requirements are expected to rebound as the fall season approaches. This should apply to cold-rolled sheets, as well as hot sheets. Currently, hot-rolled sheets are in best demand, barring certain specialties such as nickel-bearing stainless sheets.

Auto makers have not placed many orders for July and August delivery, except for special items, such as steel for bumpers. Some mills have received automotive orders for those months and can plan third quarter operations with the expectation of working fairly close to capacity. They will divert some ingots to strip, hot-rolled sheet or tin plate mills, while there are backlogs of unfilled demand. One such mill in the Pittsburgh district is booked solidly through August, expecting heavy hot-rolled sheet demand to make up for slowness in cold-finished and galvanized sheet.

This situation is not typical of most mills. The majority of producers report automotive orders are slow for third-quarter months; September production is an unknown quantity at present. Fourth quarter demand should be strong from auto makers and appliance producers.

In the New England district, substantial spot offerings of sheets, including hot-rolled ex-allotment tonnage are not being taken by consumers. In numerous instances shipments against old orders are rolling in ahead of original schedule. Deferments are requested more frequently.

There is a good diversity of demand from sheet metal fabricators. One large eastern producer is impressed by the good amount of tonnage still being required by medium and small consumers.

Plates . . .

Plate Prices, Page 168

Buying pressure for plates is not being dampened by the prospects for higher prices this summer. Demand continues as strong as ever, involving tonnages well in excess of the mills' ability to handle. Producers that have opened order books for the entire third quarter are out of the market until the fall. The mills anticipate far more inquiry for the last half of the year than they can accommodate.

There are insistent reports that some continuous mills plan to step up production of strip plate, but this has not materially changed overall supply prospects beyond causing some extra offerings of premium-priced tonnage. Whatever changes in production are effected, they will not come before the third quarter, and the first beneficiaries of the increased light plate tonnage will probably be the freight carbuilders.

Moderate improvement in supply conditions is expected in New England as more light plate tonnage becomes available in the third quarter. More strip plate tonnage will help small tank builders, body shops, electrical machinery manufacturers, railroads and, to some extent, the shipyards.

Tank fabricators, along with other leading plate consumers, have been unable to build inventories. Tank deliveries, as a result, are extended, depending somewhat on the size of tanks. One leading fabricator of water tanks is quoting seven to eight months on the smaller sizes and more than a year on tanks running 1,500,000 gallons or more. Requirements for industrial water tanks continue to increase, but are leveling off some for municipal tanks.

Due to extended deliveries, fabricators are encountering increasing competition on flat bottom tank work from builders of prestressed concrete steel tanks. Prices range about the same, but completion promises are much better on prestressed work.

Prospects of higher steel prices

this summer are a cause for uncertainty among fabricators. Some of them, in drawing up new contracts, are providing for an increase in plain material prices of as much as $12 a ton.

Steel Bars . . .

Bar Prices, Page 168

Cold-finished bar sellers are confronted with considerable last minute demand from consumers seeking to get under cover before higher prices become effective this summer and as protection if there is a steel strike.

Sellers are able to meet some of these requirements, especially where material is held in stock.

Inquiry otherwise is fairly easy. In Pittsburgh, cold finished is in much more plentiful supply, with mills and warehouses offering a wider range of sizes. In New England, converters have caught up with delivery promises on both hot-rolled and cold-finished bars.

Generally, it is expected that third quarter volume will be off. Some deferments of shipments to August are reported.

Auto makers are reportedly buying bars needed for 1957 models. They are said to be stocking tonnage in Detroit. However, delayed and somewhat spotty resumption in automotive buying is indicated in New England by failure of district forge shops to place orders for July and August shipment.

Many small consumers reportedly are protesting the recent increases in extras. Nevertheless, they are said to be raising their June delivery tonnage in anticipation of still higher prices next month.

Refractories . . .

Refractories Prices, Page 180

Full scale production of a new sillimanite base mortar, Fransil, is announced by J. H. France Refractories Co., Snow Shoe, Pa. It is intended for exceedingly high temperature applications in the nonferrous metal industries. It is recommended for use in the steel industry in hot metal mixers and cars, and in the glass industry in such applications as glass tank furnaces, feeder forehearths and glass melting furnaces. It is also recommended for use in pot furnace crowns, piers, invert arches and burner intakes.

Tubular Goods . . .

Tubular Goods Prices, Page 172

Except for mechanical tubing, demand for tubular goods is expected to hold at high level through the third quarter.

Auto requirements for mechanical tubing used in transmissions will be off in July and August. But buttweld pipe sales are expected to hold up well through both months, and no letdown in demand for seamless tubing, especially for the oil country, is indicated. Well drillers, it is reported, will have greater need for tubing this summer than had been anticipated.

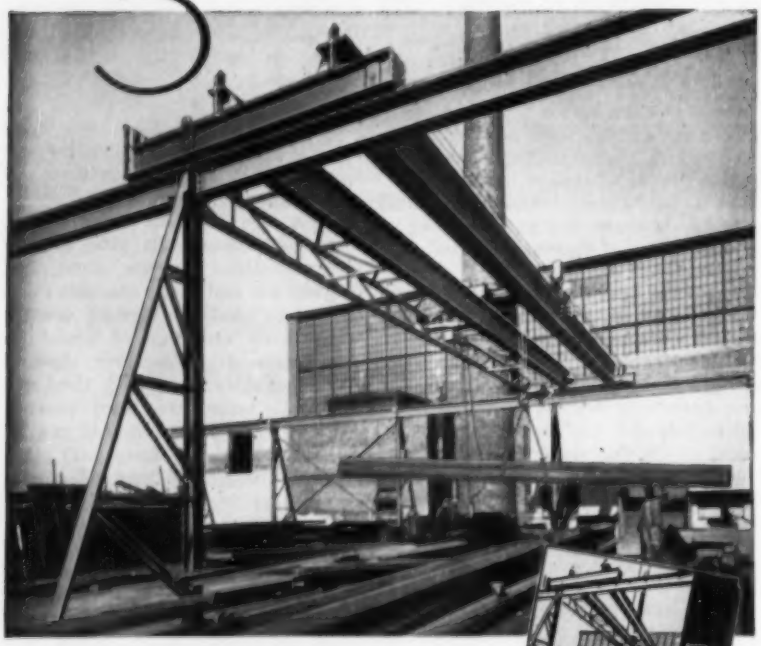
Plagued in obtaining seamless pipe in desired quantities, New England utilities are planning to cover on their 1957 program requirements earlier than usual.

In opening books for the third quarter, one leading producer that had been blanking out one month each quarter for more than a year, indicates it will accept orders for the entire three months.

New England sellers report buttweld volume is substantial, with deliveries running four to five weeks. Pressure and mechanical tubing is available in nine to ten weeks, with deliveries no longer moving beyond that range in the case of most suppliers.

Cast iron pipe sellers in the Pacific Northwest anticipate substantial demand in the coming quarter. Deliveries in the area now extend to 90

3 reasons why...



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CAPACITIES to 15 TONS—SPANS to 60 FT.

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BULLETIN C-110

Describes in detail the many design and operating advantages of CRANEMASTER overhead traveling Cranes. Also explains how Abell-Howe provides competent service from original survey to final installation.

ABELL-HOWE COMPANY 7747 Van Buren Street • Forest Park, Illinois

days. Bremerton, Wash., has placed an order for 500 tons.

Trans-Canada Pipe Lines Ltd. has placed a $45-million pipe order with Welland Tubes Ltd., Welland, Ont. The order calls for delivery of 878 miles of large diameter pipe during 1957 and 1958. The plant of Welland Tubes is under construction but will be ready for operation early next year.

Plans New Fairless Furnace

United States Steel Corp. will increase the ironmaking capacity of its Fairless Works, Morrisville, Pa., 50 per cent by adding a blast furnace. It will be identical to the existing twin stacks.

The unit will provide the plant's open-hearth furnaces with an additional 1600 tons of molten iron daily. Arthur G. McKee & Co., Cleveland, has been awarded the contract for construction of the new stack. Completion is scheduled in one year.

This move will increase substantially the mill's annual steel ingot tonnage and will result in greater utilization of finishing facilities now available at the plant. It will permit closer quality control because of the larger percentage of hot metal available for the open-hearth charge. The third blast furnace also will permit the plant to maintain its current production rate when it is necessary to reline or repair a stack.

This furnace will be equipped with an electrostatic precipitor and primary gas washer designed to keep pace with the corporation's present high smoke control standard.

Metallurgical Coke . . .

Metallurgical Coke Prices, Page 180

Republic Steel Corp. is beginning the rebuilding of four coke oven batteries at its Cleveland steel plant. The job will take about 12 months. When completed, work will start on a second battery. The entire job will take about five years. In all, 204 ovens will be rebuilt. Production of coke at the Cleveland plant last year rose to 2,523,000 tons, a new peak.

Rails, Cars . . .

Track Material Prices, Page 171

The Canadian National Railways has placed rolling stock orders to the value of $26,500,000. Three orders, each for 1000 boxcars of 50-ton capacity, went to the Eastern Car Co., Trenton, N. S., Canadian Car & Foundry Co., Montreal, and National Steel Car Corp., Hamilton, Ont. Eastern Car also has orders for 150 boxcars of 30-ton capacity, and National has one for 20 baggage cars. These new orders bring the total to nearly $91 million of new equipment ordered within the last month.

Pig Iron . . . .

Pig Iron Prices, Page 173

A terrific demand for pig iron has built up for June in many districts. It stems largely from the anticipated price advance after midyear and fear that a steel strike may cripple blast furnace operations. Consumers have placed most of their orders and are awaiting shipments.

Most of the heavier consuming shops in New England are melting five days a week. While some are not at capacity, shops supplying castings for textile mill equipment, machine tools, paper mill machinery, shoe shop equipment and railroads have fair order backlogs on which delivery is wanted with a minimum of delay.

There is no shortage of pig iron in that district, but more tonnage is coming in from New York state and other points. The Mystic furnace, due to be blown in next month, is stretching out the remainder of its stock to contract customers. That furnace will have distributed around 40,000 tons by next month since it

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DON'T let corrosion feast on your underground pipe lines, oil and water storage tanks, water works equipment and other ferrous metal installations. A Harco Cathodic Protection System will give these structures a new lease on life.
Harco's job is to protect you. Cathodic protection systems by Harco will STOP corrosion in its tracks. What's more, Harco job-engineered-systems provide the necessary testing, drawings, materials and installations.
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ROLOCK
FABRICATED ALLOYS

HEAT AND CORROSION RESISTANT

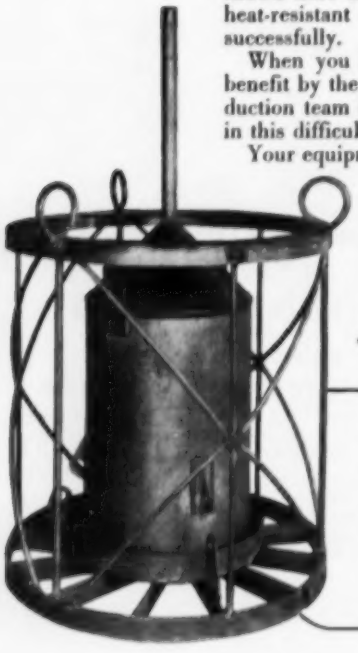
USUALLY . . . the UNUSUAL is a job for ROLOCK

The two entirely different welded alloy fabrications shown here are typical of hundreds of tough high-heat-resistant equipment problems we have solved successfully.

When you bring such problems to Rolock, you benefit by the experience of an engineering and production team that has been exceptionally successful in this difficult field.

Your equipment is built by Rolock specialists in welded fabrication of high-heat-resistant alloys . . . men who know just how to handle these special materials for best results.

Performance is safeguarded by the most careful final inspections, including, where desirable, X-ray examination, or compliance with ASME and other code requirements.



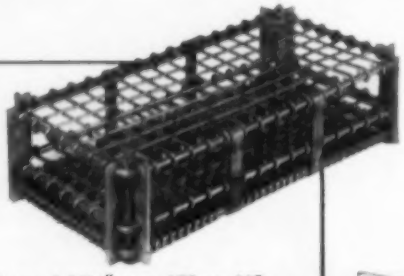
for example . . .

This Inconel retort, sand seal pan, grid support and lifting frame is one of many intricate Rolock welded fabrications for high-heat operation. It is used for brazing in a hydrogen atmosphere, alternately heated to 2200° F., lifted out of the furnace and cooled.

Size: Retort 24" diameter x 46⅝" long, excluding pipe. Supporting frame 46⅜" diameter x 57½" O.A. Weight: 200 lbs.

for example...

This special combination Incoloy heat treating carrier and locating fixture for automotive parts is 10½" x 20" x 4⅞" O.A. . . . typical of Rolock's experienced approach to special-feature design.



Top and middle layers of mesh are 1-3/16" c-c .177 or .187 — pressure-welded and then clinched around ⅜ round rod rings. Bottom layer of mesh is 2 mesh .148. Corner construction is Rolock design (patent applied for).

Write for Rolock's unique Catalog and Data Book, most comprehensive book of its kind available.

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ROLOCK INC., 1262 KINGS HIGHWAY, FAIRFIELD, CONN.

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Easier Operation, Lower Cost

4RL56

went down for repairs around the first of the year.

Foundries in the Midwest serving the automotive and farm implement industries are not as busy as they were a year ago.

Warehouse . . .

Warehouse Prices, Page 173

Mills can't fill any more new orders in the second quarter, so all fabricators who want to bolster inventories before July must buy from warehouses.

There's a heavy rush for structural shapes, plate and some sizes of hot-rolled bars. Trade interests recognize that the activity in the market is stimulated by the prospect of higher prices in July and the possibility of a work stoppage.

Distributors specializing in flat-rolled steel have had two or three months of slow business. This month is expected to be only slightly better than April and May. Fabricators aren't worried about a strike depriving them of sheet. Most distributors have ample stocks of this product and cold-finished bars. They continue to move slowly. The only increases in purchasing come from firms with low inventories of certain cold-finished bar sizes.

Structural Shapes . . .

Structural Shape Prices, Page 168

While still active, structural steel demand has leveled off a little in the East. This is said to be due principally to extended delivery promises by fabricators, although prospects of higher prices and possible labor trouble in the steel industry this summer, have some bearing.

Hesitancy in placing of business is resulting in an increase in work on drawing boards. Tonnage simply is not being placed as rapidly as plans are being developed.

More bridge tonnage, 7500 tons, currently is being estimated in New England. The bulk of it is for Connecticut where a turnpike inquiry for 5850 tons will be closed June 18, at Hartford.

Extended delivery on fabricated steel has moved completion dates out to the second half, 1957. Fabricating shops are confronted with a growing shortage of plain material, May-June mill allotments being down, and shipments running one month to six weeks behind schedule. Supply will continue lean through the third quarter, and fabricating shops show increasing reluctance to book beyond current commitments, most of them having backlogs extending through this year.

More than 9000 tons of structural

Right off your Square D Distributor's shelf!

New QMB Saflex Distribution Panelboard

Exactly the Power Panelboard you want—when you want it. Your Square D Distributor stocks boxes, interiors and plug-in units which can be quickly assembled to meet virtually any specifications. Above, interior ready for easy mounting in box.

Plug-in Units are installed easily on tubular bus bars. The solid neutral can be changed in minutes. Here is flexibility that reduces "down time" and saves money.

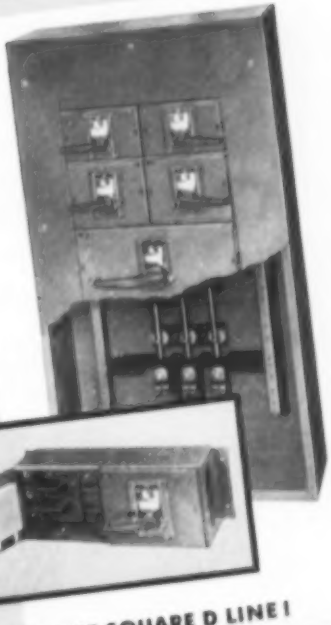
Three Simple Assembly Steps Fronts, with adjustable trim clamps, are available with or without doors.

With ALL these Quality Features

INTERIORS are flexible and adaptable to almost any service and voltage. Plug-in units and solid neutral can be changed simply and quickly.

BOXES provide generous wiring space.
FRONTS furnished with or without doors have adjustable trim clamps.

UNITS have quick-make, quick-break switch mechanism, visible blades and are horsepower rated. 30, 60, 100 and 200 ampere units are plug-in, while 400 and 600 ampere units are bolted to the bus.



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SQUARE D COMPANY

Ores

Lake Superior Iron Ore

(Prices effective for the 1956 shipping season, gross ton, 51.50% iron natural, rail of vessel, lower lake ports)

Old range bessemer $11.25
Old range nonbessemer 11.10
Mesabi bessemer 11.00
Mesabi nonbessemer 10.85
Open-hearth lump 12.10
High phos 10.85

The foregoing prices are based on upper lake rail freight rates, lake vessel freight rates, handling and unloading charges, and taxes thereon, which were in effect Dec. 1, 1955, and increases or decreases after such date are for seller's account.

Eastern Local Iron Ore

Cents per unit, deld. E. Pa.

Foundry and basic 52-62% concentrates contract 17.00-18.00

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 65% *25.00*
N. African hematite (spot) ..... *nom. 24.00-25.00*
Brazilian iron ore, 68-69% *33.00*

Tungsten Ore

Net ton unit, before duty

Foreign, wolframite, good commercial quality ..... $33.00-$35.50
Domestic, scheelite, mine 63.00

Manganese Ore

Mn 48%, delivery within six months, $1.30-$1.35 nom., per long ton unit, c.i.f. U. S. ports, duty for buyer's account; 46-47%, $1.05-$1.10 nom.

Chrome Ore

Gross ton, f.o.b. cars New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., Tacoma, Wash.

Indian and African

48% 2.8:1 ..... nom. $45.00-$50.00
48% 3:1 ..... 42.00-44.00
48% no ratio 34.00

South African Transvaal

44% no ratio ..... $26.00-$28.00
48% no ratio 33.00-35.00

Domestic

Rail nearest seller

48% 3:1 ..... $39.00

Molybdenum

Sulphide concentrate, per lb of Mo content, mines, unpacked $1.10

Antimony Ore

Per unit of Sb content, c.i.f. seaboard

55-60% ..... *$3.40-$3.85*
60-65% *3.85-3.95*

Vanadium Ore

Cents per lb V_2O_5 content, deld. mills

Domestic 31.00

Refractories

Fire Clay Brick (per 1000)

High-Heat Duty: Ashland, Grahn, Hayward, Hitchins, Haldeman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Lock Haven, Lumber, Orviston, West Decatur, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parral, Portsmouth, O., Ottawa, Ill., Stevens Pottery, Ga., $122; Salina, Pa., $127; Niles, O., $133.

Super-Duty: Ironton, O., Vandalia, Mo., Olive Hill, Ky., Clearfield, Pa., New Savage, Md., St. Louis, $150.

Silica Brick (per 1000)

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Windham, Portsmouth, O., Hawstone, Pa., $128; Warren, Niles, O., Hays, Pa., $133; Morrisville, Pa., $131.50; E. Chicago, Ind., Joliet, Rockdale, Ill., $138; Lehigh, Utah, $144; Los Angeles, $151.

Super Duty: Hays, Sproul, Hawstone, Pa., Niles, Warren, Windham, O., Leslie, Md., Athens, Tex., $145; Morrisville, Pa., $148; Joliet, Ill., $151; Curtner, Calif., $163.

Semisilica Brick (per 1000)

Clearfield, Pa., $139; Philadelphia, $124; Woodbridge, N. J., $122.

Ladle Brick (per 1000)

Dry Pressed: Alsey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Pa., Mexico, Vandalia, Mo., $88.50; Wellsville, O., $92.50; Clearfield, Pa., Portsmouth, O., $98.

High-Alumina Brick (per 1000)

50 Per Cent: St. Louis, Mexico, Vandalia, Mo., $194; Danville, Ill., $197; Philadelphia, Clearfield, Pa., $201.

60 Per Cent: St. Louis, Mexico, Vandalia, Mo., $241; Danville, Ill., $244; Philadelphia, Clearfield, Pa., $248.

70 Per Cent: St. Louis, Mexico, Vandalia, Mo., $279; Danville, Ill., $281; Philadelphia, Clearfield, Pa., $286.

Sleeves (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., $157; Clearfield, Pa., $158.50; St. Louis, $169.30.

Nozzles (per 1000)

Reesdale, Pa., $253.70; Johnstown, Pa., $259.20; Clearfield, Pa., $259.40; St. Louis, $259.45; Bridgeburg, Pa., $258.

Runners (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., $196; Clearfield, Pa., $198; St. Louis, $195.80.

Dolomite (per net ton)

Domestic, dead-burned, bulk, Billmeyer, Blue Bell, Williams, Plymouth Meeting, York, Pa., Millville, W. Va., Bettsville, Millersville, Martin, Woodville, O., Gibsonburg, Narlo, O., $15; Thornton, McCook, Ill., $15.60; Dolly Siding, Bonne Terre, Mo., $14.

Magnesite (per net ton)

Domestic, dead-burned, bulk, ½-in. grains with fines: Chewelah, Wash., $40; Luning, Nev., $40. ⅝-in. grains with fines: Baltimore, $66.40.

Metallurgical Coke

Price per net ton

Beehive Ovens

Connellsville, furnace $13.75-14.50
Connellsville, foundry 16.00-17.00

Oven Foundry Coke

Birmingham, ovens $25.65
Cincinnati, deld. 30.58
Buffalo, ovens 27.50
Buffalo, deld. 28.75
Camden, N. J., ovens 26.50
Chicago, ovens 27.00
Detroit, ovens 27.50
Detroit, deld. 28.75
Pontiac, deld. 29.15
Saginaw, deld. 30.73
Erie, Pa., ovens 27.50
Everett, Mass., ovens
New England, deld. *28.55
Indianapolis, ovens 26.75
Ironton, O., ovens 26.00
Cincinnati, deld. 28.59
Kearny, N. J., ovens 26.75
Lone Star, Tex., ovens 19.50
Milwaukee, ovens 27.50
Neville Island, (Pittsburgh) Pa., ovens 26.25
Painesville, O., ovens 27.50
Cleveland, deld. 29.43
Philadelphia, ovens 26.50
St. Louis, ovens 28.50
St. Paul, ovens 26.50
Swedeland, Pa., ovens 26.50
Terre Haute, Ind., ovens 26.75

*Or within $4.55 freight zone from works.

Coal Chemicals

Spot, cents per gallon, ovens

Pure benzene 36.00
Toluene, one deg. 32.00-34.00
Industrial xylene 32.00-35.00

Per ton, bulk, ovens

Ammonium sulfate $32.00
Birmingham area 36.00

Cents per pound, producing point

Phenol: Grade 1, 15.00; Grade 2-3, 14.50; Grade 4, 16.50; Grade 5, 15.25.

Fluorspar

Metallurgical grades, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content 72.5%, $38-$39; 70%, $35-$36; 60%, $31-$32. Imported, net tons, f.o.b. cars point of entry, duty paid, metallurgical grade: European, $34; Mexican, $26.50.

Electrodes

Threaded with nipple, unboxed, f.o.b. plant

GRAPHITE

Inches Diam	Inches Length	Per 100 lb
2	24	$52.50
2½	30	33.75
3	40	32.00
4	40	30.25
5½	40	30.00
6	60	27.25
7	60	26.75
8, 9, 10	60	24.25
12	72	27.25
14	60	23.50
16	72	22.50
17	60	23.00
18	72	22.50
20	72	22.25

CARBON

8	60	12.10
10	60	11.80
12	60	11.75
14	60	11.70
14	72	10.85
17	60	10.75
17	72	10.35
20	84	10.30
20	90	10.10
24	72, 84	10.30
24	96	10.05
30	84	10.20
40, 35	110	9.90
40	100	9.90

steel are being fabricated by the Pacific Iron & Steel Corp. for the new Mercury Division (Ford) plant in Rosemead, Calif. The building will be of all-welded construction.

With the approach of the government's new fiscal year, renewed activity in public works is expected. Considerable military work is planned in Alaska, and in Washington and Oregon. Road construction will require substantial tonnage.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

1300 tons, plant, Standard Pressed Steel Co., Jenkintown, Pa., at Anaheim, Calif., to American Bridge Division, U. S. Steel Corp., Pittsburgh.

1250 tons, rectifier manufacturing plant buildings, General Electric Co., Lynchburg, Va., to American Bridge Division, U. S. Steel Corp., Pittsburgh.

660 tons, junior high school, Millersville, Pa., to High Welding Co., Lancaster, Pa.

350 tons, building, Presbyterian hospital, Philadelphia, to Belmont Iron Works, Eddystone, Pa.

200 tons, dormitory, Ursinus College, Collegeville, Pa., to Morris Wheeler & Co., and Robinson Steel Co., Philadelphia.

150 tons, building No. 12, Armstrong Cork Co., Lancaster, Pa., to A. B. Rote & Co., Lancaster.

143 tons, Pennsylvania Railroad bridge, Rayland, O., to American Bridge Division, U. S. Steel Corp., Pittsburgh.

STRUCTURAL STEEL PENDING

11,150 tons, New Orleans and Algiers approach and viaduct, Greater New Orleans bridge, Bethlehem Steel Co., Bethlehem, Pa., low at $8,516,829.25; contract 9, combination of contracts 9A and 9B, Mississippi River Bridge Authority, New Orleans.

4450 tons, state office building, Philadelphia; bids postponed from June 6 to June 20.

2810 tons, 13 grade separations, Connecticut turnpike project 326-01, Montville, Conn.; bids June 18, Hartford, Conn.

2515 tons, eight grade separations, including two plate girder spans, Connecticut turnpike project 326-01, Lisbon; bids June 18, Hartford, Conn.

2200 tons, power plant extension, Montaup Electric Co., Somerset, Mass.; bids in to Stone & Webster Engineering Corp., Boston.

1400 tons, municipal bridge work, Henry avenue, Philadelphia, Conduit & Foundation Corp., that city, awarded general contract; on alternate bids, prestressed concrete construction was lower than structural shapes. Indications are the job will go prestressed concrete.

1300 tons, state bridge work, Bronx county, New York; bids closed June 7.

1200 tons, trash racks, stoplogs, lifting beams and gate suspensions, Barnhart Island power plant, St. Lawrence power project; bids June 15, Power Authority of the State of New York.

600 tons, state bridge work, Orange county, New York; bids closed June 7.

585 tons, five grade separations, Connecticut turnpike project 325-01, Waterford, Conn.; bids June 18, Hartford, Conn.

415 tons, bridge reconstruction, Revere Beach Parkway, Medford-Everett, Mass., Berke-Moore Co., Boston, low on general contract; also 100 tons, reinforcing bars.

400 tons, state bridge work, Westchester county, New York; bids June 28.

400 tons, addition, general hospital, Lancaster, Pa.; bids closed June 11.

395 tons, St. Luke's Hospital, Bethlehem, Pa., H. T. Stoudt & Sons, Allentown, Pa., awarded general contract.

315 tons, state highway bridges, five beam spans, Winchester, Conn.; bids in.

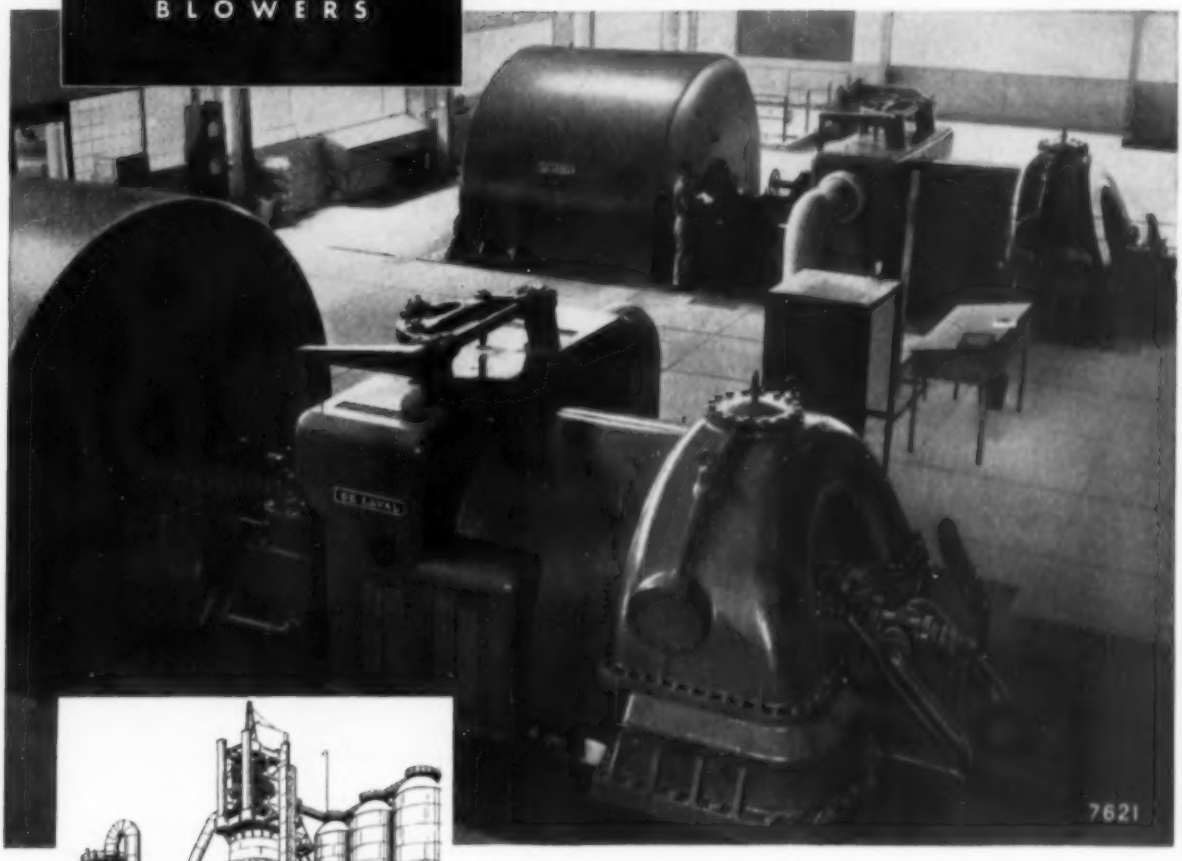
230 tons, three state bridges, beam spans, Manchester, N. H.; bids June 14, Concord, N. H.

225 tons, National Guard armory, Dover, Del.

(Please turn to page 184)

DE LAVAL
STEEL MILL
BLOWERS

designed for giant furnaces



These twin De Laval blowers, on the job in a leading mid-western steel mill, are among the largest ever built. Each is a five-stage unit with a rated capacity to deliver 121,000 cfm of air at 35 psig discharge pressure. Each is driven by a 15,220 hp, 2,500 rpm De Laval 16-stage steam turbine operating under steam conditions of 400 psig, 750 F with 28 in. vac.

The total weight of each De Laval turbine and blower is over 167 tons; the blower alone is over 212,000 lbs. Shafts of the turbine and blower were made large and heavy to meet the wide range of varying speed conditions required in blast furnace service. Outside diameter of the blower casing is 12 ft. and it is divided horizontally in the plane of the shaft. This permits raising the upper half of the casing for easy access to all interior parts. • For a quarter of a century, De Laval has pioneered in advanced blower engineering designs and practices. De Laval builds single and multi-stage centrifugal blowers and compressors for service in steel, gas and coke plants. Discuss your specific applications with a De Laval Sales Engineer.

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DSL-334

Current Ferroalloy Quotations

MANGANESE ALLOYS

Spiegeleisen: Carlot, per gross ton, Palmerton, Pa. 21-23% Mn, $96.50; 19-21% Mn, 1-3% Si, $94; 16-19% Mn, $92.

Standard Ferromanganese: (Mn 74-76%, C 7% approx.) Base price per net ton $215. Duquesne, Johnstown, Sheridan, Pa.; Philo, O.; Tacoma, Wash.; Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. Add or subtract $2 for each 1% or fraction thereof of contained manganese over 76% or under 74%, respectively.

(Mn 79-81%). Lump $223 per net ton, f.o.b. Anaconda or Great Falls, Mont. Add $2.60 for each 1% above 81%; subtract $2.60 for each 1% below 79%, fractions in proportion to nearest 0.1%.

Low-Carbon Ferromanganese, Regular Grade: (Mn 85-90%). Carload, lump, bulk, max. 0.07% C, 31.95c per lb of contained Mn, carload packed 33c, ton lots 34.5c, less ton 35.7c. Delivered. Deduct 1.5c for max 0.15% C grade from above prices, 3c for max 0.30% C, 5.5c for max 0.50% C, and 6.5c for max 75% C—max 7% Si. **Special Grade:** (Mn 90% min, C 0.07% max, P 0.06% max). Add 2.05c to the above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.25-1.5%, Si 1.5% max). Carload, lump, bulk 23.55c per lb of contained Mn, packed, carload 23.9c, ton lot 25.5c, less ton 26.7c. Delivered. Spot, add 0.25c.

Manganese Metal: 2" x D (Mn 95.5% min, Fe 2% max, Si 1% max, C 0.2% max). Carload, lump, bulk, 45c per lb of metal; packed, 46.75c; ton lot 47.25c; less ton lots 49.25c. Delivered. Spot, add 2c.

Electrolytic Manganese Metal: Min carload, 31.5c; 2000 lb to min carload, 33.5c; 250 lb to 1999 lb, 35.5c; less than 250 lb, 36.5c. Premium for hydrogen-removed metal, 0.75c per lb. Prices are f.o.b. cars, Knoxville, Tenn., freight allowed to St. Louis or to any point east of Mississippi; or f.o.b. Marietta, O., freight allowed.

Silicomanganese: (Mn 65-68%). Contract, lump, bulk 1.50% C grade, 18-20% Si, 12c per lb of alloy. Packed, c.l. 13c, ton 13.45c, less ton 14.45c, f.o.b. Alloy, W. Va., Ashtabula, O., Marietta, O., Sheffield, Ala., Portland, Oreg. For 2% C grade, Si 15-17%, deduct 0.2c from above prices. For 3% C grade, Si 13-14.5%, deduct 0.4c from above prices. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max, Si 4% max, C 0.10% max). Contract, ton lot 2" x D, $1.50 per lb of contained Ti; less ton $1.55. (Ti 38-43%, Al 8% max, Si 4% max, C 0.10% max). Ton lot $1.35, less ton $1.37 f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis. Spot, add 5c.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract $200 per ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi river and north of Baltimore and St. Louis.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 2-4.5%). Contract $225 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, c.l., lump, bulk 26.25c per lb of contained Cr; c.l. packed 27.5c, ton lot 29.25c, less ton 30.65c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: (Cr 67-71%). Contract, carload, lump, bulk, C 0.025% max (Simplex) 31.75c per lb contained Cr, 0.02% max 38.50c, 0.03% max 38c, 0.06% max 36.50c 0.1% max 36c, 0.15% max 35.75c, 0.2% max 35.50c, 0.5% max 35.25c, 1.0% max 34c, 1.5% max 33.85c, 2.0% max 33.75c. Ton lot, add 3.1c, less ton add 4.8c. Carload packed add 1.45c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, High-Carbon: (Cr 62-66%, C 5-7%, Si 7-10%). Contract, c.l. 2 in. x D, bulk 27.4c per lb contained Cr. Packed, c.l. 28.7c, ton 30.5c, less ton 32c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, Low-Carbon: (Cr 50-54%, Si 28-32%, C 1.25% max). Contract, carload, packed 8 M x D, 19.6c per lb of alloy, ton lot 20.85c; less ton lot, 22.05c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome-Silicon: (Cr 39-41%, Si 42-49%, C 0.05% max). Contract, carload, lump, 4" x down and 2" x down, bulk, 39.05c per lb of contained Cr; 1" x down, bulk 39.8c. Delivered.

Chromium Metal, Electrolytic: Commercial grade (Cr 99.8% min, metallic basis, Fe 0.2 max). Contract, carlot, packed 2" x D plate (about ¼" thick) $1.25 per lb, ton lots $1.27, less ton lots $1.29. Delivered. Spot, add 5c.

VANADIUM ALLOYS

Ferrovanadium: Open-hearth Grade (V 50-55%, Si 8% max., C 3% max). Contract, any quantity, $3.10 per lb of contained V. Delivered. Spot, add 10c. **Special Grade** (V 50-55% or 70-75%, Si 2% max, C 0.5% max) $3.20. **High Speed Grade** (V 50-55%, or 70-75%, Si 1.50% max, C 0.20% max) $3.30.

Grainal: Vanadium Grainal No. 1, $1.05 per lb; No. 6, 65c; No. 79, 50c, freight allowed.

Vanadium Oxide: Contract, less carload lots, packed, $1.33 per lb contained V_2O_5, freight allowed. Spot, add 5c.

SILICON ALLOYS

25-30% Ferrosilicon: Contract, carload, lump, bulk, 20.0c per lb of contained Si. Packed 21.40c; ton lot 22.50c f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump, bulk, 12.75c per lb of contained Si. Packed, c.l. 14.85c, ton lot 16.3c, less ton 17.95c. F.o.b. Alloy, W. Va., Ashtabula, Marietta, O., Sheffield, Ala., and Portland, Oreg. Spot, add 0.45c.

Low Aluminum 50% Ferrosilicon: (Al 0.40% max). Add 1.2c to 50% ferrosilicon prices.

65% Ferrosilicon: Contract, carload, lump, bulk, 14.5c per pound contained silicon. Packed, c.l. 16.2c, ton lot, 18c; less ton, 19.35c. Delivered. Spot, add 0.35c.

75% Ferrosilicon: Contract, carload, lump, bulk, 15.4c per lb of contained Si. Packed, c.l. 17.05c, ton lot 18.7c, less ton 19.95c. Delivered. Spot, add 0.3c.

90% Ferrosilicon: Contract, carload, lump, bulk, 18.5c per lb of contained Si. Packed, c.l. 19.95c, ton lot 21.35c, less ton 22.4c. Delivered. Spot, add 0.25c.

Silicon Metal: (Min 98% Si, 0.75% max Fe, 0.07% max Ca). C.l. lump, bulk 20.5c per lb of Si. Packed, c.l. 21.95c, ton lot 23.25c, less ton 24.25c. Add 0.5c for max 0.03 Ca grade. Deduct 0.5c for max 2% Fe grade analyzing min 96.5% Si. Spot, add 0.25c.

Alsifer: (Approx. 20% Al, 40% Si, 40% Fe). Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 10.65c per lb of alloy, ton lot, packed, 11.8c.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloy: (Zr 12-15%, Si 39-43%, C 0.20% max). Contract, c.l. lump, bulk 8.5c per lb of alloy. Packed, c.l. 9.5c, ton lot 10.65c, less ton 11.5c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max). Contract, carload, lump, packed 26.25c per lb of alloy, ton lot 27.4c, less ton 28.65c. Freight allowed. Spot, add 0.25c.

BORON ALLOYS

Ferroboron: (B 17.50% min, Si 1.50% max, Al 0.50% max, C 0.50% max). Contract, 100 lb or more 1" x D, $1.20 per lb of alloy; less than 100 lb $1.30. Delivered. Spot, add 5c. F.o.b. Washington, Pa., prices, 100 lb and over, are as follows: Grade A (10-14% B) 85c per pound; Grade B (14-18% B) $1.20; Grade C (19% min B) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si), $5.25 per lb contained B, delivered to destination.

Bortam: (B 1.5%-1.9%). Ton lots, 45c per lb; smaller lots, 50c per lb.

Carbortam: (B 1 to 2%). Contract, lump, carloads 9.50c per lb. f.o.b. Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%). Contract, carload, lump, bulk 22c per lb of alloy, carload packed 23.05c, ton lot 24.95c, less ton 25.95c. Delivered. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.5-3%). Contract, carload, lump, bulk 21.5c per lb of alloy, carload packed 22.95c, ton lot 25.25c, less ton 26.75c. Delivered. Spot, add 0.25c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx. 3% lb each and containing 2 lb of Cr). Contract, carload, bulk, 16.95c per lb of briquet, carload packed in box pallets 17.15c, in bags 17.85c; 3000 lb to c.l. in box pallets 18.35c; 2000 lb to c.l. in bags, 19.05c; less than 2000 lb in bags 19.95c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx. 3 lb and containing 2 lb of Mn). Contract, carload, bulk 13c per lb of briquet, c.l. packed, pallets 13.2c, bags 14c; 3000 lb to c.l., pallets 14.4c; 2000 lb to c.l. bags, 15.2c, less ton 16.1c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx. 3½ lb and containing 2 lb of Mn and approx. ½ lb of Si). Contract, c.l. bulk 13.55c per lb of briquet, c.l. packed, pallets, 13.75c; bags 14.55c, 3000 lb to c.l., pallets, 14.95c; 2000 lb to c.l., bags, 15.75c; less ton 16.65c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx. 5 lb and containing 2 lb of Si). Contract, carload, bulk 7.15c per lb of briquet; packed, pallets, 7.35c; bags 8.15c; 3000 lb to c.l., pallets, 8.95c; 2000 lb to c.l. bags 9.75c; less ton 10.65c. Delivered. Spot, add 0.25c.

(Small size—Weighing approx. 2½ lb and containing 1 lb of Si). Carload, bulk 7.3c. Packed, pallets 7.5c; bags 8.20c; 3000 lb to c.l. pallets 9.1c; 2000 lb to c.l. bags 9.9c; less ton 10.8c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each) $1.33 per pound of Mo contained, f.o.b. Langeloth, Pa.

TUNGSTEN ALLOYS

Ferrotungsten: (70-80%), 5000 lb W or more $3.45 per lb of contained W; 2000 lb W to 5000 lb W, $3.55; less than 2000 lb W, $3.67. Delivered.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 50-60%, Si 8% max, C 0.4% max). Contract, ton lot, 2" x D, $6.90 per lb of contained Cb. Delivered. Spot, add 10c.

Ferrotantalum—Columbium: (Cb 40% approx., Ta 20% approx., and Cb plus Ta 60% min C 0.30% max). Ton lots, 2" x D, $4.65 per lb of contained Cb plus Ta, delivered; less ton lots $4.70.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx.) Contract, c.l. packed ½-in. x 12 M, 18.5c per lb of alloy, ton lots 19.65c, less ton 20.9c. Delivered. Spot, add 0.25c.

Graphidox No. 5: (Si 48-52%, Ca 5-7%, Ti 9-11%). C.l. packed, 18.5c per lb of alloy, ton lots 19.65c; less ton lots 20.9c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed 17.2c per lb of alloy; ton lots 18.7c; less ton lots 19.95c, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis.

Simanal: (Approx. 20% each Si, Mn, Al; bal. Fe). Lump, carload, bulk 17.50c. Packed c.l. 18.50c, 2000 lb to c.l. 19.50c, less than 2000 lb 20c per lb of alloy. Delivered.

Ferrophosphorus: (23-25% based on 24% P content with unitage of $4 for each 1% of P above or below the base); carload, f.o.b. sellers' works, Mt. Pleasant, Siglo, Tenn., $80 per gross ton.

Ferromolybdenum: (55-75%). Per lb contained Mo, in 200-lb containers, f.o.b. Langeloth, Pa., $1.54 in all sizes except powdered which is $1.66; Washington, Pa., furnace, any quantity $1.46.

Technical Molybdic-Oxide: Per lb contained Mo, f.o.b. Langeloth, Pa.; $1.31 in cans; in bags, $1.30, f.o.b. Langeloth, Pa.; $1.24, Washington, Pa.

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Portrait by Fabian Bachrach

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STEEL
The Metalworking Weekly

(Concluded from page 180)

200 tons, two state bridges, beam spans Providence, R. I.; bids June 13.

200 tons, state bridge work, Queens county, New York; bids June 28.

100 tons, 6-story steel frame parking garage, Spokane, Wash.; general contract to H. Halversen Inc., Spokane, by Parkmaster Systems Inc.

100 tons, including reinforcing and miscellaneous, Deadwood tunnel; bids to Bureau of Reclamation, Medford, Oreg., July 2.

REINFORCING BARS . . .

REINFORCING BARS PLACED

1500 tons, power house and catapult, Navy, Lakehurst, N. J., through Roscoe Construction Co., Washington, D. C., to Sweets Steel Co., Williamsport, Pa.

1230 tons, North Allen Homes, Philadelphia Housing Authority, Philadelphia, through Paul Tishman, New York, to Igoe Bros., New York.

1200 tons, office building, City Line, Philadelphia, for Beacon Corp. for leasing to the Gulf Oil Co., to Bethlehem Steel Co., Bethlehem, Pa.; unstated tonnage of structural shapes placed with Belmont Iron Works, Eddystone, Pa.

1150 tons, high school, Philadelphia, to McCloskey & Co., general contractor, to American Steel Engineering Co., that city.

640 tons, government ammunition storage buildings, with 300 tons placed through the Montgomery Construction Co., to Taylor-Davis Inc., Philadelphia; 175 tons through the Thompson Construction Co. to Taylor-Davis Inc.; and 165 tons through the Widell Construction Co., to the Concrete Steel Co., Philadelphia.

600 tons, Campbell Soup Co., Camden, N. J., through the Turner Construction Co., to the Bethlehem Steel Co., Bethlehem, Pa.

450 tons, senior high school, Lower Merion, Pa., to the Concrete Steel Co., Philadelphia.

400 tons, building, Chrysler Corp., Newark, Del., to Bethlehem Steel Co., Bethlehem, Pa.

395 tons, steel mesh, McMillan water reservoir, Tacoma, Wash., to Bethlehem Pacific Coast Steel Corp., Seattle; Cherf Bros. & Sandkay Contractors Inc., Ephrata, Wash., general contractor.

375 tons, state highway bridge, Berks county, Pa., through J. Julian to Bethlehem Steel Co., Bethlehem, Pa.

350 tons, sanitorium, Pennsylvania State Authority, Pa., to U. S. Steel Supply Division, U. S. Steel Corp., Pittsburgh.

250 tons, Elwood school, Board of Education, Philadelphia, through McCloskey & Co., general contractor, to U. S. Steel Supply Division, U. S. Steel Corp., Pittsburgh.

205 tons, junior high school, Penn Valley, Pa., through Frank Wilson, contractor, to Concrete Steel Co., Philadelphia.

200 tons, state bridge, Philadelphia county, Pa., through Francis A. Canuso, general contractor, Philadelphia, to Bethlehem Steel Co., Bethlehem, Pa.

200 tons, plant addition, Alan Wood Steel Co., Conshohocken, Pa., to Bethlehem Steel Co., Bethlehem, Pa.

190 tons, building, Wilmington Savings Fund Society, Wilmington, Del., through Di Sabatino, general contractor, to Taylor-Davis Inc., Philadelphia.

175 tons, library, Wellesley College, Wellesley, Mass., to U. S. Steel Supply Division, U. S. Steel Corp., Cambridge, Mass., through George A. Fuller Co., Boston, general contractor; 70 tons of structurals to Groisser & Shlager Iron Works, Somerville, Mass.

150 tons, junior high school, Upper Darby, Pa., through Wark Co., Philadelphia, general contractor, to Concrete Steel Co., Philadelphia.

150 tons, ramp P-12, Pennsylvania approach to Philadelphia-Gloucester bridge, for the Delaware River Port Authority, through Kaufman Construction Co., Philadelphia, general contractor, to American Steel Engineering Co., Philadelphia.

130 tons, Moore Institute dormitory, University of Pennsylvania, Philadelphia, to Truscon Steel Co., Philadelphia; Frank Wilson, general contractor.

129 tons, Washington state overpass, Kitsap county, to Bethlehem Pacific Coast Steel Corp., Seattle; Anderson Bridge Construction Co., Tacoma, Wash., general contractor.

119 tons, including 65 tons for telephone addition, Bellingham, Wash., and 54 tons for an Alaskan installation, Manson-Osberg Co., Seattle, general contractor, to Bethlehem Pacific Coast Steel Corp., Seattle.

REINFORCING BARS PENDING

1170 tons, office superstructure, Philadelphia Transportation Co., Philadelphia; general contract awarded to McCloskey & Co., Philadelphia.

500 tons, Tacoma County-City building; plans revised for second bidding to county commissioners July 10.

300 tons, three guided missile installations near Elmendorf, Alaska; bids to U. S. Engineer, Seattle, June 21.

PIPE . . .

CAST IRON PIPE PLACED

500 tons, largely 18 in. for Bremerton, Wash., to Pacific States Cast Iron Pipe Co., Seattle.

RAILS, CARS . . .

RAILROAD CARS PLACED

800 Line, 15 seventy-ton hopper cars, to General American Transportation Corp., Chicago.

Union Tank Car Co., 123 tank cars to own shops.

RAILROAD CARS PENDING

New York City Transit Authority, 450 subway cars, bids in July for opening about Aug. 15.

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Scrap . . .

Scrap Prices, Page 186

Pittsburgh—No. 1 heavy melting scrap dipped slightly last week. An independent mill bought at $45 a ton, while another on the fringe of the district purchased a minor tonnage for $46. This represented a decline of $1 a ton from the previous week's quotation. No. 2 steel was subject to greater price declines. An independent mill and the neighboring mill paid $40 for No. 2 heavy melting and $37 for No. 2 bundles.

Chicago—Another large mill has purchased leading grades of steel scrap at prices virtually identical with those paid by another important steelmaker a few days previously. It would appear some stability will govern the market for a few days. Blast furnace grades are off $1 in a new purchase to put machine shop turnings at $26 and short shoveling turnings at $28. Demand for all types of scrap, including cast grades, is light.

Philadelphia—With recent purchases by the Fairless, Pa. mill, prices on the major open-hearth grades of scrap have moved to a firm basis. No. 1 heavy melting. No. 1 bundles and No. 1 busheling are holding at $48, delivered, No. 2 heavy melting at $40, and No. 2 bundles at $38. There has been a little buying by other consumers at these levels since the Fairless purchase.

Until wage negotiations have been settled, buying by district mills may be fairly light, with consumers drawing largely from their inventories. There is mounting apprehension with regard to the possibility of a steel strike. Most consumers do not want to be caught with scrap moving to their mills. Meanwhile, foreign demand has eased.

Since prices started to slip, scrap collections have dropped off.

Boston—Brokers have lowered their buying prices on borings and turnings, notably the latter, with heavy melting steel grades off to $38-$38.50, shipping point for No. 1 steel. The last purchase by district mills was at $41.50. There is no buying currently. The market has been consistently $1.50 to $2 higher for shipment to district mills, but within the $4 freight area. Shipments against orders are substantial, but new buying is light.

Cleveland—The tone of the scrap market continues easy here. Not much change is anticipated until the steel wage issue, now nearing a showdown, is definitely settled. And even though a strike should be averted, a seasonal letdown in steelmaking operations is expected in the third quarter. Not much in the way of demand for steelmaking grades of scrap is seen in the weeks immediately ahead.

Cincinnati — June was a rugged month for scrap men. As much as $9 was lopped off No. 1 heavy from the highs of a month ago. Reported broker buying price for No. 1 heavy melting is $43-$44, off $3 from a week ago. Other grades went down less sharply.

New York—Scrap brokers have dropped buying prices on several grades. They are offering to buy No. 1 heavy melting and No. 1 bundles at $40-$41, No. 2 heavy melting at $32-$33, and No. 2 bundles at $30-$31.

Machine shop turnings have been marked down to $20-$21, mixed borings and turnings ta $27-$28, short shoveling turnings at $29-$30, and low phos structurals and plate to $46-$47. Heavy breakable cast is off $2 to $44-$45.

Buffalo—Mill scrap prices are off

(*Please turn to page* 188)

Steel Import Prices

(Base per 100 lb, landed, duty paid. Source of shipment: Western continental European countries)

	North Atlantic	South Atlantic	Gulf Coast	West Coast
Deformed Bars, Intermediate, ASTM-A-305	$6.80	$6.80	$6.80	$7.20
Bar Size Angles	6.75	6.75	6.75	7.15
Structural Angles	7.05	7.05	7.05	7.45
I-Beams	7.45	7.45	7.45	7.85
Plates	8.50	8.50	8.50	8.90
Sheets, H.R.	8.75	8.75	8.75	9.15
Furring Channels, C.R., 1000 ft. ¾ x 0.30 lb per ft	26.50	26.50	26.50	30.46
Barbed Wire (†)	6.50	6.50	6.50	6.85
Merchant Bars	6.80	6.80	6.80	7.20
Hot-Rolled Bands	7.10*	7.10*	7.10*	7.50*
Wire Rods, Thomas Commercial No. 5	6.50	6.50	6.50	6.90
Wire Rods, O-H Cold Heading Quality No. 5	6.90	6.90	6.90	7.30
Bright Common Wire Nails	7.60	7.60	7.60	8.00

Oil Country Pipe: Prices on all sizes equalized with Pittsburgh plus barge freight to New Orleans and Houston, where available.

*Nominal. †Per 82-lb. net. reel. ‡Per 100-lb kegs, 20d nails and heavier

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Iron and Steel Scrap

Consumer prices, per gross ton, except as otherwise noted, including broker's commission, as reported to STEEL. *Changes shown in italics.*

STEELMAKING SCRAP COMPOSITE

June 6	$46.17
May 29	47.17
Apr. Avg.	54.90
May 1955	34.87
May 1951	44.00

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania

PITTSBURGH

No. 1 heavy melting	*44.00-45.00*
No. 2 heavy melting	*39.00-40.00*
No. 1 bundles	*44.00-45.00*
No. 2 bundles	*36.00-37.00*
No. 1 busheling	*44.00-45.00*
Machine shop turnings	*32.00-33.00*
Mixed borings, turnings	*32.00-33.00*
Short shovel turnings	*36.00-37.00*
Cast iron borings	*36.00-37.00*
Cut structurals, 3 ft lengths	*55.00-56.00*
Heavy turnings	*44.00-45.00*
Punchings & plate scrap	*55.00-56.00*
Electric furnace bundles	*55.00-56.00*

Cast Iron Grades

No. 1 cupola	50.00-51.00
Charging box cast	46.00-47.00
Heavy breakable cast	46.00-47.00
Unstripped motor blocks	34.00-35.00
No. 1 machinery cast	56.00-57.00

Railroad Scrap

No. 1 R.R. heavy melt.	*57.00-58.00*
Rails, 2 ft and under	*68.00-69.00*
Rails, 18 in. and under	*69.00-70.00*
Rails, random lengths	*64.00-65.00*
Railroad specialties	*62.00-63.00*

Stainless Steel Scrap

18-8 bundles & solids	360.00-375.00
18-8 turnings	255.00-270.00
430 bundles & solids	110.00-120.00
430 turnings	60.00-65.00

CLEVELAND

No. 1 heavy melting	47.00-48.00
No. 2 heavy melting	36.00-37.00
No. 1 bundles	47.00-48.00
No. 2 bundles	33.00-34.00
No. 1 busheling	47.00-48.00
Machine shop turnings	30.00-31.00
Mixed borings, turnings	34.00-35.00
Short shovel turnings	34.00-35.00
Cast iron borings	34.00-35.00
Low phos.	48.00-49.00
Cut structural plates 2 ft and under	51.00-52.00
Alloy free, short shovel turnings	37.00-38.00
Electric furnace bundles	48.00-49.00

Cast Iron Grades

No. 1 cupola	53.00-54.00
Charging box cast	39.00-40.00
Stove plate	50.00-51.00
Heavy breakable cast	43.00-44.00
Unstripped motor blocks	28.00-29.00
Brake shoes	38.00-39.00
Clean auto cast	51.00-52.00
Burnt cast	38.00-39.00
Drop broken machinery	54.00-55.00

Railroad Scrap

No. 1 R.R. heavy melt.	51.00-52.00
R.R. malleable	56.00-57.00
Rails, 2 ft and under	64.50-65.50
Rails, 18 in. and under	63.00-64.00
Rails, random lengths	59.00-60.00
Cast steel	53.00-54.00
Railroad specialties	53.00-54.00
Uncut tires	54.00-55.00
Angles, splice bars	59.00-60.00
Rails, rerolling	62.00-63.00

Stainless Steel

(Brokers' buying prices; f.o.b. shipping point)

18-8 bundles, solids	345.00-355.00
18-8 turnings	205.00-215.00
430 clips, bundles, solids	100.00-110.00
430 turnings	50.00-60.00

YOUNGSTOWN

No. 1 heavy melting	49.00-50.00
No. 2 heavy melting	38.00-39.00
No. 1 bundles	49.00-50.00
No. 2 bundles	36.00-37.00
No. 1 busheling	49.00-50.00
Machine shop turnings	30.00-31.00
Short shovel turnings	36.00-37.00
Cast iron borings	36.00-37.00
Low phos.	51.00-52.00
Electric furnace bundles	50.00-51.00

Railroad Scrap

No. 1 R.R. heavy melt.	53.00-54.00

CHICAGO

No. 1 heavy melting	*44.00-48.00*
No. 2 heavy melting	*36.00-37.00*
No. 1 factory bundles	*48.00-49.00*
No. 1 dealer bundles	*44.00-45.00*
No. 2 bundles	33.00-34.00
No. 1 busheling	*44.00-48.00*
Machine shop turnings	*25.00-26.00*
Mixed borings, turnings	*27.00-28.00*
Short shovel turnings	*27.00-28.00*
Cast iron borings	*27.00-28.00*
Cut structurals, 3 ft	52.00-53.00
Punchings & plate scrap	53.00-54.00

Cast Iron Grades

No. 1 cupola	45.00-46.00
Stove plate	*39.00-40.00*
Unstripped motor blocks	32.00-33.00
Clean auto cast	47.00-48.00
Drop broken machinery	47.00-48.00

Railroad Scrap

No. 1 R.R. heavy melt.	*49.00-50.00*
R.R. malleable	*58.00-59.00*
Rails, 2 ft and under	*66.00-67.00*
Rails, 18 in. and under	*67.00-68.00*
Angles, splice bars	*62.00-63.00*
Rails, rerolling	*69.00-70.00*

Stainless Steel Scrap

18-8 bundles & solids	389.00-395.00
18-8 turnings	270.00-280.00
430 bundles & solids	105.00-110.00
430 turnings	55.00-60.00

DETROIT

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*38.00*
No. 2 heavy melting	*32.00*
No. 1 bundles	*39.00*
No. 2 bundles	*27.50*
No. 1 busheling	*38.00*
Machine shop turnings	*21.00*
Mixed borings, turnings	*21.00*
Short shovel turnings	27.00
Punchings & plate scrap	*56.00*

Cast Iron Grades

No. 1 cupola	46.00
Charging box cast	*38.00*
Stove plate	38.00
Heavy breakable	38.00
Unstripped motor blocks	*25.00*
Clean auto cast	51.00
Malleable	*51.00*

BIRMINGHAM

No. 1 heavy melting	36.00-37.00
No. 2 heavy melting	34.00-35.00
No. 1 bundles	36.00-37.00
No. 2 bundles	25.00-26.00
No. 1 busheling	36.00-37.00
Cast iron borings	21.50-22.50
Short shovel turnings	29.00-30.00
Machine shop turnings	27.00-28.00
Electric furnace bundles	44.00-45.00

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	48.50-49.50
Stove plate	47.00-48.00
Bar crops and plate	52.00-53.00
Structural & plate, 2 ft	51.00-52.00
Unstripped motor blocks	37.50-38.50
Charging box cast	32.00-33.00
No. 1 wheels	39.00-40.00

Railroad Scrap

No. 1 R.R. heavy melt.	*46.00-47.00*
Rails, 18-in. and under	62.00-63.00
Rails, rerolling	65.00-66.00
Rails, random lengths	58.00-59.00
Angles, splice bars	57.00-58.00

PHILADELPHIA

No. 1 heavy melting	$48.00
No. 2 heavy melting	40.00
No. 1 bundles	48.00
No. 2 bundles	38.00
No. 1 busheling	48.00
Electric furnace bundles	52.00
Mixed borings, turnings	*35.00-36.00*
Machine shop turnings	*32.00*
Short shovel turnings	*37.00*
Heavy turnings	44.00
Structurals & plates	54.00-55.00
Couplers, springs, wheels	*60.00*
Rail crops, 2 ft & under	*65.00*

Cast Iron Grades

No. 1 cupola	*49.00*
Malleable	67.00
Heavy breakable cast	54.00
Drop broken machinery	56.00

NEW YORK

(Brokers' buying prices)

No. 1 heavy melting	*40.00-41.00*
No. 2 heavy melting	*32.00-33.00*
No. 1 bundles	*40.00-41.00*
No. 2 bundles	*30.00-31.00*
Machine shop turnings	*20.00-21.00*
Mixed borings, turnings	*27.00-28.00*
Short shovel turnings	*29.00-30.00*
Low phos. (structural & plate)	*46.00-47.00*

Cast Iron Grades

No. 1 cupola	44.00-45.00
Unstripped motor blocks	33.00-35.00
Heavy breakable	*44.00-45.00*

Stainless Steel

18-8 sheets, clips solids	340.00-350.00
18-8 borings, turnings	170.00-180.00
430 sheets, clips, solids	120.00-125.00
410 sheets, clips, solids	100.00-105.00

BOSTON

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	38.00-38.50
No. 2 heavy melting	30.00-30.50
No. 1 bundles	38.00-38.50
No. 2 bundles	27.50-28.00
No. 1 busheling	38.00-38.50
Machine shop turnings	*21.00-22.00*
Mixed borings, turnings	*25.00-25.50*
Short shovel turnings	*27.00-27.50*
No. 1 cast	42.00-42.50
Mixed cupola cast	40.50-41.00
No. 1 machinery cast	43.50-44.00

BUFFALO

No. 1 heavy melting	*45.00-46.00*
No. 2 heavy melting	*36.00-37.00*
No. 1 bundles	*45.00-46.00*
No. 2 bundles	*33.00-34.00*
No. 1 busheling	*45.00-46.00*
Mixed borings, turnings	*27.00-28.00*
Machine shop turnings	*26.00-27.00*
Short shovel turnings	*28.00-29.00*
Cast iron borings	*27.00-28.00*
Low phos.	*50.00-51.00*

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	*45.00-46.00*
No. 1 machinery	*50.00-51.00*

Railroad Scrap

Rails, random lengths	*54.00-55.00*
Rails, 3 ft and under	*59.00-60.00*
Railroad specialties	*50.00-51.00*

CINCINNATI

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*43.00-44.00*
No. 2 heavy melting	*33.50-34.50*
No. 1 bundles	*43.00-44.00*
No. 2 bundles	*31.00-32.00*
No. 1 busheling	*43.00-44.00*
Machine shop turnings	*24.00-25.00*
Mixed borings, turnings	28.00-29.00
Short shovel turnings	28.00-29.00
Cast iron borings	27.00-28.00
Low phos., 18 in.	*52.00-53.00*

Cast Iron Grades

No. 1 cupola	*43.00-44.00*
Heavy breakable cast	*43.00-44.00*
Charging box cast	*43.00-44.00*
Drop broken machinery	*53.00-54.00*

Railroad Scrap

No. 1 R.R. heavy melt.	52.00-53.00
Rails, 18 in. and under	65.00-66.00
Rails, random lengths	58.00-59.00

ST. LOUIS

(Brokers' buying prices)

No. 1 heavy melting	39.00
No. 2 heavy melting	36.00
No. 1 bundles	39.00
No. 2 bundles	32.00
No. 1 busheling	39.00
Machine shop turnings	†
Short shovel turnings	*28.00*

Cast Iron Grades

No. 1 cupola	45.00
Charging box cast	32.00
Heavy breakable cast	32.00
Unstripped motor blocks	32.00
Brake shoes	42.00
Clean auto cast	45.00
Stove plate	40.50

Railroad Scrap

No. 1 R.R. heavy melt.	52.00
Rails, 18 in. and under	66.00
Rails, random lengths	61.50
Rails, rerolling	*72.00*
Angles, splice bars	55.00

†Nominal

SEATTLE

No. 1 heavy melting	42.00
No. 2 heavy melting	36.00-38.00
No. 1 bundles	36.00-38.00
No. 2 bundles	26.00-28.00
No. 3 bundles	20.00
Machine shop turnings	23.00-25.00
Mixed borings, turnings	23.00-25.00
Electric furnace No. 1	52.00-55.00

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	40.00-43.00
Heavy breakable cast	37.00
No. 1 wheels	37.00
Unstripped motor blocks	38.00-41.00
Stove plate (f.o.b. plant)	38.00-41.00
Brake shoes	38.00

Railroad Scrap

Rails, random lengths	40.00

LOS ANGELES

No. 1 heavy melting	38.00
No. 2 heavy melting	32.00
No. 1 bundles	37.00
No. 2 bundles	28.00
Machine shop turnings	17.00

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	42.00

SAN FRANCISCO

No. 1 heavy melting	*43.00*
No. 2 heavy melting	*40.00*
No. 1 bundles	*42.00*
No. 2 bundles	*35.00*
Machine shop turnings	20.00-23.00
Mixed borings, turnings	20.00-23.00
Cast iron borings	20.00-23.00
Short shovel turnings	25.00
Cut structurals	45.00
Heavy turnings	20.00-23.00
Punchings & plate scrap	44.00

Cast Iron Grades

No. 1 cupola	48.00
Charging box cast	*42.00*
Stove plate	39.00
Heavy breakable cast	*39.00*
Unstripped motor blocks	*38.00*
Brake shoes	35.00
Clean auto cast	48.00
No. 1 wheels	39.00
Burnt cast	23.00
Drop broken machinery	50.00

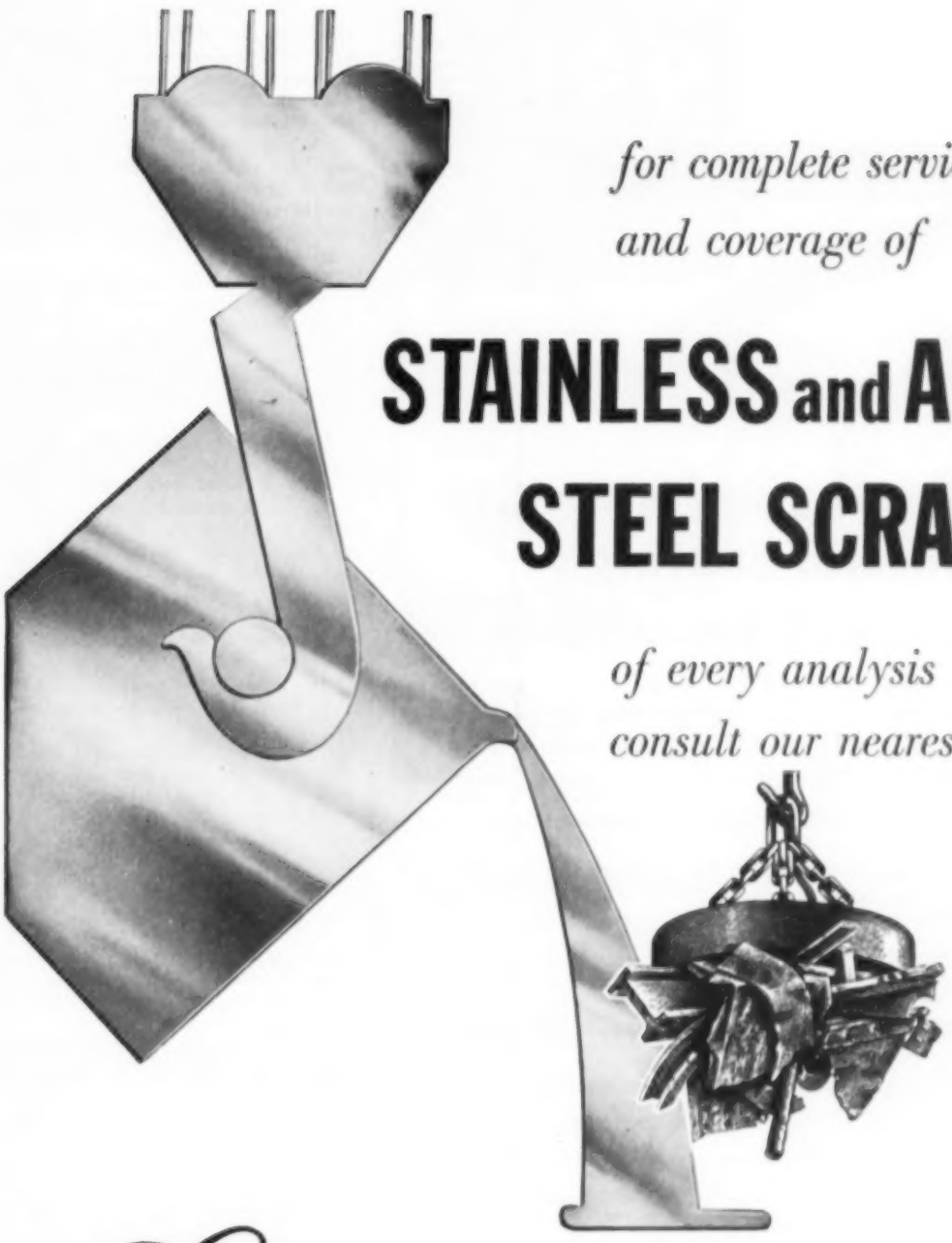
HAMILTON, ONT.

No. 1 heavy melting	*45.00*
No. 2 heavy melting	*40.00*
No. 1 bundles	*45.00*
No. 2 bundles	*37.50*
Mixed steel scrap	*39.00*
Busheling, new factory:	
Prepared	*43.00*
Unprepared	*39.00*
Short steel turnings	*28.00*

Cast Iron Grades†

No. 1 machinery cast	50.00

†F.o.b., shipping point.



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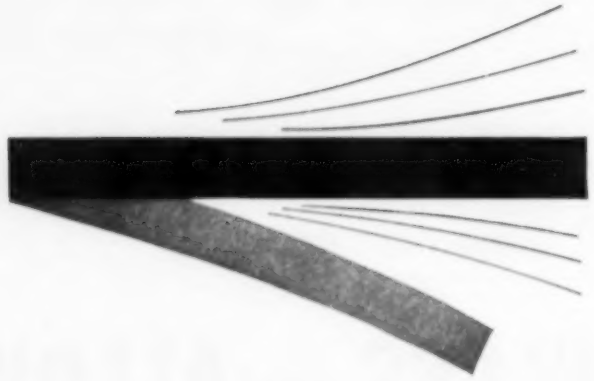

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(Concluded from page 185)

about $5 a ton following purchase by a leading consumer of substantial tonnage for June delivery. Included were No. 2 heavy melting at $37, No. 2 bundles at $34, short shoveling turnings at $29, and mixed borings and turnings at $28. The consumer price on No. 1 steel was cut to $46 although No. 1 tonnage was not included in the mill purchase just reported.

The cast market also shows signs of retreating from recent high price levels despite continued heavy buying by Canadian consumers. Blast furnace grades are nominal, as are prices on the various railroad and specialty items.

Detroit—The scrap market continues weak, and prices are quoted down on the basis of new orders placed by a local consuming mill. No. 1 heavy melting is quoted at $38, No. 2 at $32. Brokers feel the market has not reached bottom. Steelmaking operations here last week were estimated at 95 per cent, practically unchanged from the immediately preceding week.

St. Louis—The scrap market is firm here. In fact, a $3-per-ton rise on rerolling rails is reported. Despite the fact the mills are loaded with scrap and there is some expectation of a business letdown in the third quarter, the market has not weakened pricewise. Deals are on a day-to-day basis with little or no speculation evident in the current market situation.

Los Angeles—Prices are unsteady. Some large consumers are refraining from making purchases because of the weak market undertone that is generally in evidence.

San Francisco — Prices have advanced $3 a ton on top grades of steel scrap, but the market undertone is uncertain. Whether the higher price levels can be held is questionable. A few cast iron grades have moved up $3 to $7 a ton.

Seattle—While No. 1 and No. 2 heavy melting are quoted at $42 and $38, scrap dealers sense signs of weakness. Activity is noted in both domestic and export branches of the market, but individual deals vary from reported price levels dealers and brokers report.

The Navy will open bids June 12 for the sale of scrap at its Puget Sound yard.

Iron Ore . . .

Iron Ore Prices, Page 189

Shipments of iron ore from upper Great Lakes ports this season are running close to 3 million tons above those in the like period last year.

Total movement to June 1 this year was 18,227,969 gross tons, 2,864,216 tons more than in the period ended June 1, 1955.

In May this year shipments amounted to 12,553,857 tons, against 11,605,747 in May a year ago. Figures for the latest week of record, ended June 4, show shipments in the period totaled 2,947,927 tons, against 2,827,934 in the like week a year ago.

Canada . . .

In March, pig iron output in Canada amounted to 292,642 net tons, compared with 268,457 in February and 275,729 in March, 1955. In the first three months of this year, production totaled 846,183 net tons, for a new quarterly record. Output was 690,268 tons in the like period of 1955.

Production of steel ingots and castings in March amounted to 430,825 net tons, against 400,638 in February and 284,614 in March, 1955. For the first quarter, 1956, production was 1,275,063 net tons. This compares with 1,022,665 tons in the like quarter last year.

Canadian production of primary iron and steel shapes in February, 1956, reached the all-time monthly record total of 523,644 net tons. This compares with 486,842 in January and 341,780 in February, 1955. Output for the month included 176,044 tons delivered under producers' interchange for further processing within primary plants.

Shipments for sale in February amounted to 340,133 net tons, against 323,989 in January and 212,402 in February a year ago.

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11B Beatty hvy-duty 350-ton punch—1945
9"—Nat'l. Upsetter w/air clutch, 42
Newton 42" Cold Saw w/Hyd. Control
15' x 10' x 36' Betts Hvy-duty Planer
42" x 108" Niles hvy-duty geared head Lathe w/profiling att., 1943
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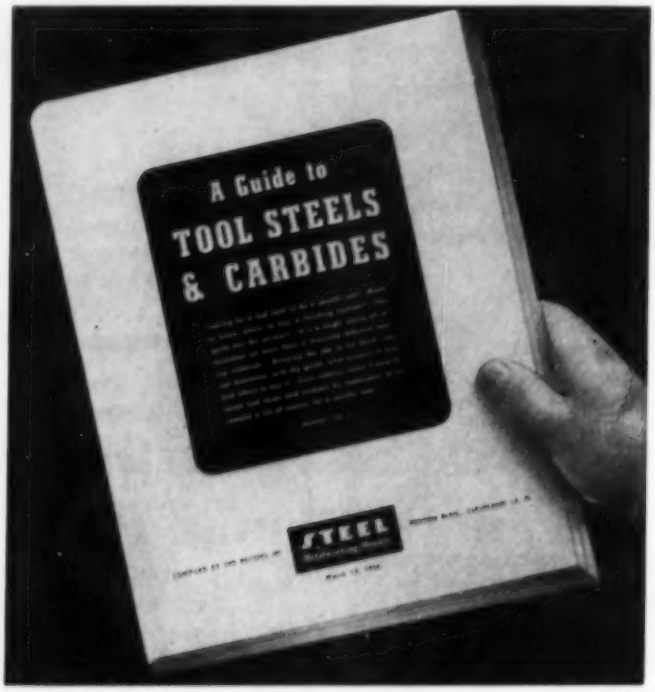

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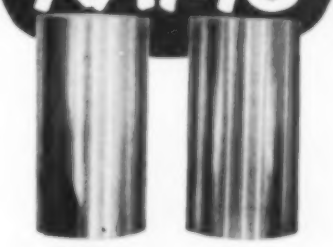
RAMS



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BETHLEHEM STEEL

Compact Cleveland Speedaire on winch which hoists equipment. Photos courtesy of Ellicott Machine Corporation, Baltimore, Md.

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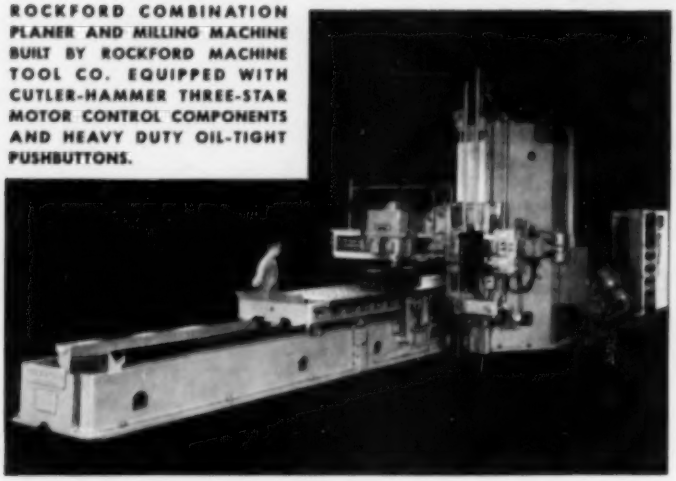

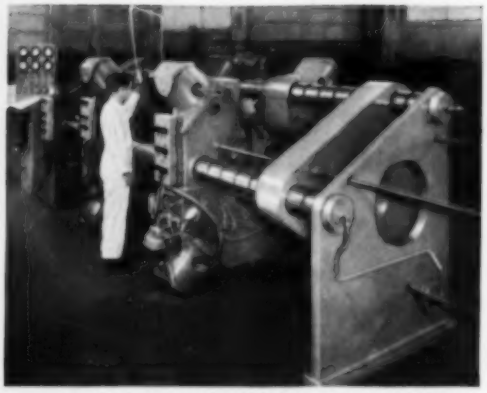

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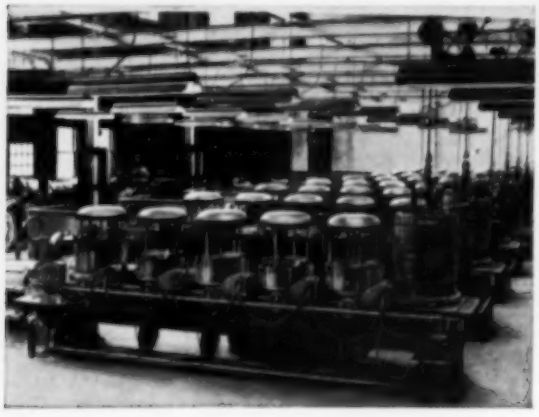

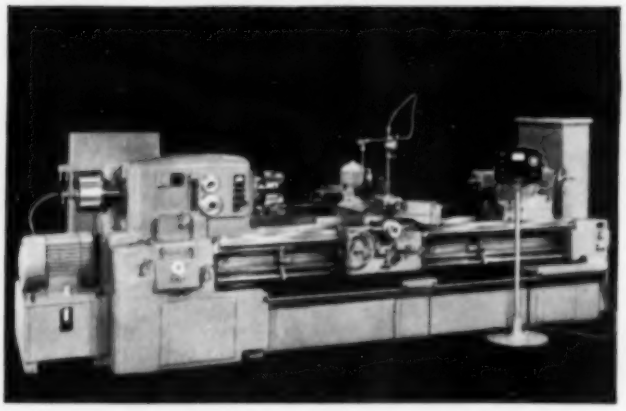

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